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COMPUTERWORLD

RATING THE IS FUNCTION: MARKETING MANAGERS SPEAK OUT
See Management, page 129

Users cast cool eye on Apple, IBM deal

By Ed Scannell and Mark Halper

Now that IBM, Apple Computer, Inc. and Motorola, Inc. have finally agreed on a common hardware platform after three years of delay, questions left hanging in the balance include what the software plans are and whether users even care.

Last week, in an announcement that many observers termed "disappointing," the partners confirmed they will produce a single PowerPC hardware standard. However, the specification will not be available until next spring, and systems based on the specification will not appear before 1996.

Moreover, the companies declined to address software issues, such as licensing the Macintosh operating system to IBM, except to say that users will be able to buy the Macintosh operating system at retail outlets and that the new specification will support multiple operating systems.



The powerful juggernaut of Microsoft Corp. and Intel Corp. will still be go-

Users, *page 28*

Steady Windows 95 migration expected

By Stuart J. Johnston and Ed Scannell

While its operating system competitors squabble and pontificate about the superiority of their offerings, Microsoft Corp. is rapidly moving to consolidate its desktop dominion.

That effort is having an impact. Systems managers at more than a dozen corporations, universities and governmental organizations contacted by *Computerworld* last week said they will move to Windows 95 — carefully, but with deliberate speed.

Most of the managers said that while they plan to exhaustively test the next generation of Windows before beginning widespread deployment, they expect more than half of their users will convert during the first 12 months of its commercial release.

On the bandwagon

In a recent report, Michael Kwatinetz, an analyst at PaineWebber, Inc. in New York, estimated there will be 76 million Windows 3.x users by the time Windows 95 ships. He predicted that nearly 16% of them will upgrade to Windows 95 within 12 months of its release. Kwatinetz also predicted that virtually all PCs would ship with the system by the end of its first year on the market.

Microsoft has said it intends to ship Windows 95 during the first half of next year.

"I have thousands of users, and those that have Windows and are computer literate will probably start [migrating] within the first six months," said Rick Gifford, an information systems consultant for Washington state's Department of Social and Health Services in Olympia. "Probably half of my users will move to Windows 95 in the first 12 months."

"I'm sure we'll upgrade to it six months to a year after its initial release," agreed Tim Rice, computer-aided design manager at Loschky Marquardt & Nesholm Architects in Seattle.

Windows 95, *page 187*

NetWare 4.1 takes Novell to the wire

By William Brandel

In his keynote address at Comdex/Fall '94 in Las Vegas this week, Novell, Inc. Chairman Robert Frankenberg will try to lay out a convincing argument for the company's latest version of its next-generation operating system.

Frankenberg will outline plans for a number of new technologies that will take advantage of the directory services in NetWare 4.1. The product — Novell's fourth take on its ill-received NetWare 4.x line — is to be delivered to users the week of Dec. 5.

Analysts and users last week said this rollout is critical to Novell, which must deliver a solid, workable version of NetWare 4.1 if the software is to be the network operating system upgrade of choice at user sites.

"This one better be the charm," said a vice president of information systems at a major in-

NetWare, *page 187*

IBM to untangle billing knots

By Craig Stedman
ATLANTA

Meet a company struggling to modernize a big, ugly, troublesome mainframe application that was developed decades ago and has become a major headache for customers.

The company in question? IBM.

The computer giant is attempting to bring its notoriously discombobulated billing and order entry system to heel in order to coordinate all non-PC software-related charges, IBM executives confirmed at the Guide International Corp. user group conference here last week.

Ellen Hancock, IBM's senior vice president and group executive for networking and software products, said the revamped software billing system should be in place by next March or April. Code-named Software Easy, it will unify a hodgepodge of generic databases tied to IBM's hardware platforms into a DB2 environment. The change is supposed to present

IBM, *page 16*

IBM hopes to present customers with a single bill for all non-PC software license and maintenance fees.

R&D: MEASURE OF SUCCESS



A COMPUTERWORLD SPECIAL REPORT ON THE RESEARCH AND DEVELOPMENT PAYOFF

By Gary H. Anthes and Mitch Betts

The computer industry's R&D laboratories are the cauldrons in which new technologies bubble away, often for years at a stretch.

But the cooks are using very different recipes, according to an extensive *Computerworld* study of 50 prominent hardware, software and networking companies.

Indeed, there is no standard approach for turning research and development spending into financial success. Neither is there a guarantee that lavish use of research dollars will promise profitability.

Combined with interviews of R&D executives and analysts, the study uncovered some little-known trends and quirks of R&D in the information technology industry, including the following:

- There is little or no correlation between how many dollars are poured into R&D and how many surface on the bottom line in the short term. But R&D spending often accompanies respectable gains in sales, market share and market value a few years down the road. Some prime examples of this phenomenon are Microsoft Corp., Silicon Graphics, Inc. and Sybase, Inc.
- Apple Computer, Inc. is an R&D leader among desktop hardware vendors. It spent 8.5% of its sales revenue on R&D in the five-year period studied. Yet clone makers Dell Computer Corp. and AST Research, Inc. spent less than 4

R&D, *page 82*

Newspaper


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What's Inside

November 14, 1994

CW GUIDE

When the PC price is right



The high cost of high-end chips and lack of applications that take full advantage of the processing power are just two reasons Intel 486 users are slow to make the switch to Pentium. *See CW Guide, Page 139.*
If that's not enough reason to stick with the 486, street prices will hit rock bottom by mid-1995 as the Pentium market heats up, analysts predict. *See Marketplace, Page 174.*

NEWS

■ Both Microsoft and Lotus have fallen behind in their delivery schedules for client/server **messaging systems** due to lack of large systems experience. *Page 2*

■ **Asynchronous Transfer Mode** is rounding an adoption curve as more users are ready to pilot the neophyte technology. *Page 2*

■ **Dun & Bradstreet Software** gets set to roll out its next generation of SmartStream. *Page 4*

■ **Paging networks** will be out by the end of next year and could make IS pay attention to small communications devices. *Page 4*

■ A commercial **Internet** service will offer a "mall" containing details of thousands of shrink-wrapped applications. *Page 6*

■ Unocal recently decided to scrap a request for proposals for an enterprise **network management** system and issue a broader outsourcing proposal. *Page 8*

■ Mainframe storage maker **EMC** is putting an entry into the high-end Unix market. *Page 10*

■ Lotus and Hewlett-Packard announce their widely anticipated pact to jointly develop **groupware** and messaging products. *Page 12*

■ Updated **mobile products**, including a new Hewlett-Packard OmniBook, will come to light this week at Comdex/Fall '94. *Page 14*

■ IBM plans to underlay its **CICS** transaction monitor with an object-oriented development framework but not until late 1995 or early 1996. *Page 16*

DESKTOP COMPUTING

■ The second major beta release of **Windows 95** contains almost every feature promised in the final release. *Page 47*

■ Beta users put WordPerfect's **PerfectOffice** suite through its paces. *Page 47*

WORKGROUP COMPUTING

■ A small company has **Notes** add-in software that fills several management holes in Notes. *Page 69*

ENTERPRISE NETWORKING

■ America Online's new graphical user interface underscores the pressure that **on-line service providers** are under to become more appealing to users. *Page 79*

LARGE SYSTEMS

■ **Sybase**'s plans for its next big database release — System 11 — represent an about-face for the company on some basic database philosophies. *Page 91*

■ IBM's new air-cooled **parallel mainframes** are drawing user interest. *Page 91*

APPLICATION DEVELOPMENT

■ **Next**'s Enterprise Objects Framework releases a product that lets object-oriented applications access, encapsulate and use data stored in relational databases. *Page 119*

CAREERS

■ As **organizations flatten and change,** how does the technology that professionals are used to working with reflect the way they like to work? *Page 163*

COMMENTARY

■ **Charles Babcock** says partitioning capabilities give the edge to a couple of fresh faces in the client/server tools arena. *Page 6*

■ **Paul Gillin** says Microsoft and Bill Gates can rest easy in the wake of the IBM/Apple agreement. *Page 42*

■ Microsoft's and IBM's strategy of bundling just about everything into their operating systems may save buyers money in the short term, but it will lead to long-term problems, **Carole Patton** says. *Page 57*

■ **Ken Lownie** says good Notes help is hard to find. *Page 69*

■ On the road to mobile computing? **Ted Prince** doesn't think so. *Page 79*

■ Open systems cannot be expected to work miracles, **George Shaffner** says. *Page 96*

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Executive Briefing

They will move carefully but steadily to Windows 95. Systems managers at more than a dozen large organizations told *Computerworld* last week that they will exhaustively test Windows 95, the next version of Windows, before beginning widespread deployment. But managers also said they expect to convert more than half of their users to the new operating system in the first 12 months of its commercial release. *Cover 1*

None other than IBM is struggling to modernize a thorny mainframe application in order to coordinate its notoriously convoluted software billing and order entry system. *Cover 1*

Although virtual branch banking initiatives are starting to shape up, IS and business executives still have major communication gaps to bridge to make these visions pay off, according to two upcoming reports on banking and information technology. *Page 4*

Data, data everywhere . . . but how are product marketing managers supposed to make strategic decisions based on literally millions of pieces of information provided by their scanners? Too often, the IS support staff isn't making the job any easier. So what can IS do to keep delighting the marketer? *Page 129*

Companies moving to client/server networks have found themselves turning to various user groups for help with a whole new set of mostly network-related problems. While many participants say they are happy with the impact these groups have on vendors, all agree there are areas that still need major work. *Page 20*

On site this week. Prudential Securities has rolled out 450 Unix workstations as part of its efforts to implement the first all-IBM trading floor environment on Wall Street. *Page 69*. Bank of Boston is completing the rollout of a 140-seat Sun Microsystems-based trading floor environment for its treasury group in Boston. *Page 73*. A Philadelphia-based start-up company has hit upon an expert-system-based method for identifying not only what customers want but why they want it. *Page 120*. An expert system helps Kaiser Foundation Health Plan more effectively screen and process applicants. *Page 121*

The 5th Wave *by* Rich Tennant



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Client/server strategies

E-mail delays foil plans

Complexity, limited large systems experience cited

By Lynda Radosevich and Suruchi Mohan

Last year, Microsoft Corp. and Lotus Development Corp. promoted their next-generation client/server messaging systems as answers to users' messaging prayers. But both companies have fallen far behind on their delivery schedules, leaving users to cope by sitting tight or moving to lesser-known alternatives.

Specifically, Microsoft's Exchange — known previously as Spitfire, EMS and Touchdown — was once promised for late 1993 delivery. Lotus said in September 1993 that the Lotus Communications Server (LCS) would ship late this year or early next year. And while both companies say products are scheduled for mid-1995 delivery at the earliest, sources claim even that is a stretch.

The desktop leaders' lack of large systems experience is behind the delays, observers agreed. Delivering both end-user client features and good server performance is more complex than the vendors anticipated.

Aggravating the expertise problem, both companies purchased their successful LAN packages rather than develop them in-house, said Walter Ulrich, a director at Arthur D. Little, Inc.'s Pacific Southwest division in Los Angeles.

In general, client/server messaging systems are said to be more robust and manageable than file-sharing systems such as Lotus' CC:Mail and Microsoft's Mail, which rely on intelligent desktop software to store messages in "dumb" Novell, Inc. NetWare files. Specifically, Microsoft and Lotus said Exchange and LCS, respectively, would provide the manageability and scalability that mainframe users require in enterprise systems.

Benefits abound

Client/server messaging off-loads much of the processing to the server and establishes client and server connections via remote procedure calls. Among other benefits, this allows the server to gather statistics, thereby increasing manageability.

Yet another benefit is reduced administration costs. Because of the architecture, file-sharing systems are limited to handling roughly 200 users per server. So large user sites require hundreds of servers and dozens of administrators. Conversely, the client/server architecture in Exchange and LCS is said to enable servers to support more than 1,000 users. The undelivered products are also supposed to include remote administration and management features.

"Depending on the number of [LAN electronic-mail] servers in a building, I figure one administrator for every 300 to 400 mailboxes [is enough]. But with a product like Exchange and the ability to do remote administration, theoretically one person should be able to do it," said the manager of information systems at a large petroleum company.

For that reason and others, roughly one-third of mainframe messaging users are likely to migrate to client/server messaging during the next two years, according to Judy Rosall, an analyst at International Data Corp. in Framingham, Mass. She based her estimates in part on a recent survey of 60 users.

Trying to cope

In the meantime, users waiting for Lotus and Microsoft to deliver are taking several different tacks to cope, including delaying migration off mainframe messaging and moving to lesser-known alternatives.

"We're interested in taking advantage of client/server messaging and giving users additional [E-mail] features, like attaching files and voice messages," said Randy Rehn, an IS manager at Nordstrom, Inc. in Seattle. "But if the products aren't available and stable, how can we plan to migrate?"

Instead, Nordstrom will continue to use a mainframe E-mail system from Computer Associates International, Inc. called CA-EMail+, Rehn said.

Some users said they will count on updates to the file-sharing systems, such as a recently announced monitoring tool for CC:Mail, to stretch their systems.

Other users said they are moving to options such as Oracle Corp.'s Office, Hewlett-Packard Co.'s OpenMail and various Unix-based messaging systems. Some also said they are anticipating a client/server update to Novell's GroupWise (formerly WordPerfect Office) in the second half of next year. However, while these systems solve certain scalability issues, some are expensive, and none have the end-user following of Lotus and Microsoft.

Lotus said users can turn to Notes for some client/server messaging features. However, Notes E-mail still lacks the scalability users want. Notes Release 4.0, which will be the core of LCS, is expected to address scalability, the company said.

Microsoft officials did not return calls by press time.

Until these client/server message products ship, options are somewhat limited. "It seems the choices are one of large-scale, Unix-based systems or single LAN environments with a lot of administrative tasks. There's nothing in the middle," said Paula Briten, senior systems analyst at Safeco Insurance Cos. in Seattle.

Get your CICS in '95

How will E-mail-based client and server applications be purchased during the next two years?

NUMBER OF RESPONDENTS	CLIENT	SERVER
Centralized buying from IS (for enterprisewide purchase)	43	42
Decentralized buying from various departments	6	6
Decentralized buying with standards set by IS	5	6
Don't know	1	1

Base: 55 companies

Source: International Data Corp., Framingham, Mass.

Good Notes help is hard to find. See page 69.

Users anticipate benefits from ATM

By Stephen P. Klett Jr.
WASHINGTON

■ Several users in the midst of aggressive pilot projects of ATM networking technology said last week that although the road to the promised land may be strewn with potholes, they expect their gains to be worth the initial pains.

Users at the Next Generation Networks 1994 conference here said they expect to reap the benefits of Asynchronous Transfer Mode (ATM), including reduction in business cycle times, better network response time and less money spent on technology each year. ATM gear is expected to have a life span of at least 10 to 15 years. Some users estimated ATM will cut roughly 25% off their recurring line charges each year simply because it provides a bigger, faster data pipe.

"We're very encouraged by our efforts with ATM and are happy with the technology so far," said David Beering, a staff telecommunications analyst at Amoco Corp. in Chicago. "However, at the same time, we realize it is nowhere near where it needs to be" to be implemented commercially, he added. "That's not a knock — it's simply reality."

Share the wealth

Amoco, Computer Sciences Corp., Bankers Trust Co., Northeast Utilities, Sandia National Laboratories and Texas Children's Hospital were among those companies sharing their early ATM experiences with other conference attendees.

Most of these companies, however, do not plan to move mission-critical applications to ATM for at least two years. Many critical ATM standards, such as those for LAN emulation and for traffic and congestion management, are incomplete, and there is a general lack of network management and analysis tools. "The total warm, fuzzy feeling in regard to ATM is probably two years away for us," said Walter Gould, a senior systems scientist at Computer Sciences in Huntsville, Ala.

Computer Sciences is implementing the NASA Program Support Communications Network (PSCN) Pilot ATM Project. PSCN is a long-distance, digital communications network based on ATM. The network's goal is to provide NASA with data communications, message services, including electronic mail and fax, and video and voice teleconferencing.

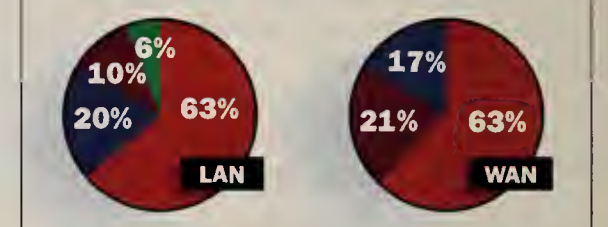
For its part, Amoco's project ARIES — which stands for ATM Research and Industrial Enterprise Study — will connect five major sites spanning five states using ATM services from Sprint Corp., Ameritech Corp. and WilTel over DS-3 links.

At least 17 other vendors are involved in the project, which is one of the largest ATM pilot efforts in the world. It is also the only one with three interconnected carrier services, Beering said. Amoco plans to demonstrate the network next month. According to industry observers, this handful of early adopters represents only the tip of the iceberg. Hundreds of companies across the U.S. are either starting or planning their own pilots. Rather than turning up only at large government sites or multinational companies, ATM is beginning to trickle down into smaller companies running ordinary applications, industry watchers said.

"There seems to be a clear consensus that if companies want to become large, they have to be involved in ATM," said E. W. Bud Huber, general manager at Hughes Electronics in Los Angeles. "The question is how and when, not if."

Steady ATM interest

WHAT ARE YOUR PLANS TO IMPLEMENT ATM?



Figures do not equal 100% due to rounding.
Figures based on an October 1994 survey.
Base: 350 sites

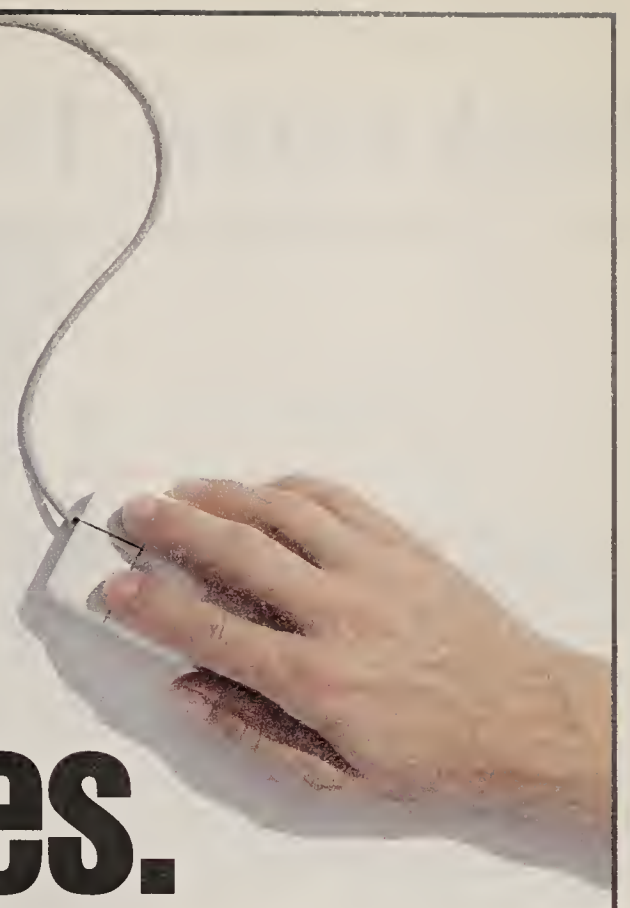
Source: Business Research Group, Newton, Mass.

On its way

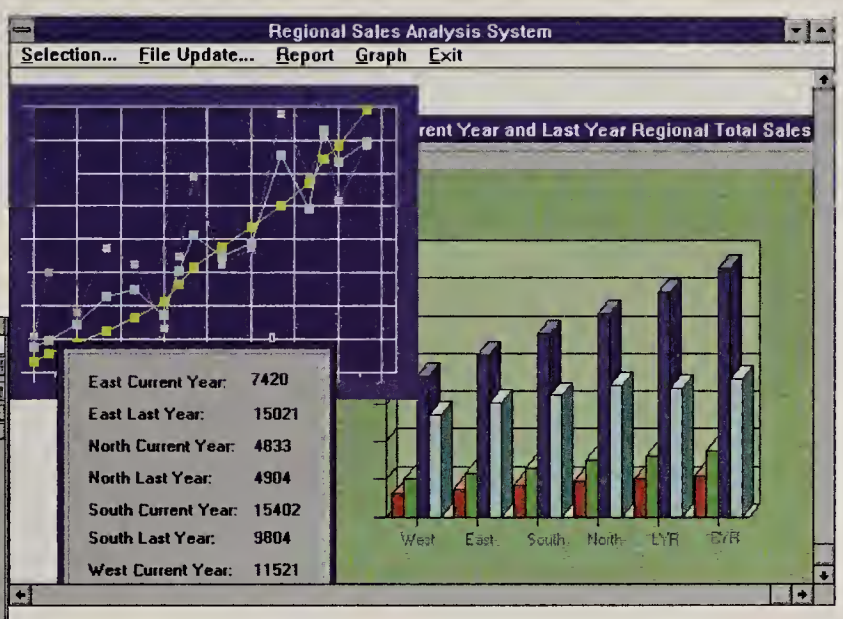
Digital Equipment Corp. will announce this week ATM switch and interface adapter technology already in use at 30 sites. The Gigaswitch/ATM, at $2,600 per port and expandable to 52 ports, is intended for LAN backbones and high-performance workgroups.

Fore delivers ATM to the desktop. See page 79.



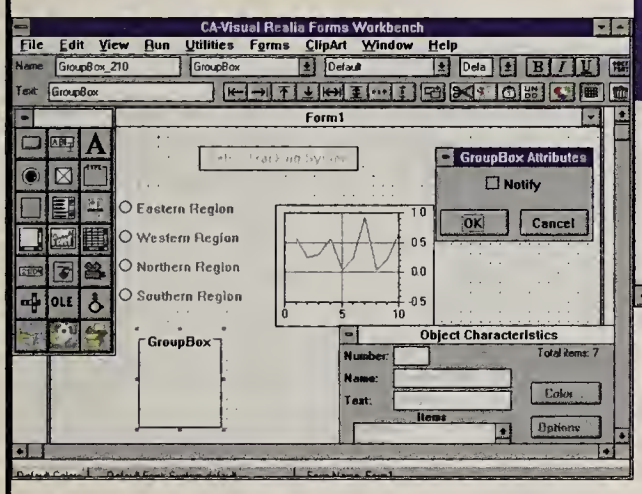


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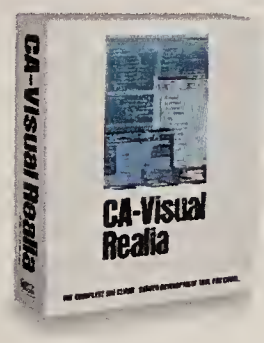
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Bank execs, IS not talking

Studies say communication gaps call for new approach

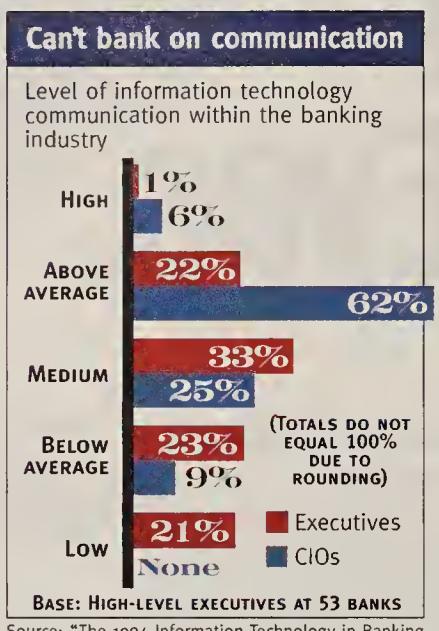
By Thomas Hoffman

What we have here is a failure to communicate.

That is the message bank executives are sending to their chief information officers in a new report being released today that examines the role of technology in the banking industry.

For example, while only 9% of the CIOs interviewed said their firms have failed to effectively outline an information systems vision to the lines of businesses they support, a full 30% of business leaders reported a void in this area, according to the "1994 Information Technology in Banking Survey."

This report from *American Banker*, The Tower Group and Andersen Consulting was based on interviews with CIOs and wholesale and retail banking executives at 53 of the largest 150 U.S. banks (see chart).



Source: "The 1994 Information Technology in Banking Survey" by *American Banker*, The Tower Group and Andersen Consulting

Rosier portrait

But another report from Ernst & Young and the American Bankers Association paints a more optimistic view of IS.

"The Fourth Annual Special Report on Technology in Banking," slated for release next month, points to an anticipated 21% increase in IS spending by U.S. banks in the next three years — from $16.35 billion this year to $19.8 billion in 1997. This will occur as banks accelerate the development of new financial services to retail customers through branches, phone services and home banking.

For these developments to occur, however, new kinds of thinking are required to bridge the gap between business requirements and supporting technology, banking IS executives and analysts said.

"Business needs often aren't reflected in the types of technologies and systems that [information technology] people want to build," said Diogo Teixeira, president of The Tower Group, a banking/technology consultancy in Wellesley, Mass. "Businesspeople continue to be perplexed by the difficulties of achieving the benefits of technology that are constantly being touted by the press, vendors, even their own [IS] staffs."

Some banks have taken innovative approaches to aligning IS more closely with business.

For example, in 1991 the Bank of Boston Corp. deployed a concept referred to as "partnering." An executive who runs one of the bank's 11 business divisions is assigned a technology "partner," or IS manager, who becomes an integral part of his division. The partner attends all business-related sessions, and his compensation is based on the performance of the unit and the success of the technology used, said Michael Lezenski, chief technology officer at the $44.3 billion (in assets) bank.

"The gap between what business requires and what IS delivers is a universal problem; it's not just limited to banking," said Craig D. Goldman, senior vice president and CIO at The Chase Manhattan Bank NA in New York. At Chase, Arthur Ryan's ascension from the IS ranks to president and chief operating officer in 1990 helped the $102 billion bank's business leaders grasp the contribution technology can make to the bottom line.

Prudential rolls out a new trading floor. See page 72.

D&B SmartStream may start ripples

By Rosemary Cafasso

In the client/server software arena, Dun & Bradstreet Software has a lot of catching up to do. But some observers expect the launch of SmartStream Release 3.0, scheduled for today, to be a start.

Release 3.0 will be the first full client/server suite from D&B Software, marking the debut of the long-awaited manufacturing and distribution software, sources said. The suite could put D&B Software on par with SAP America, Inc. and Oracle Corp., which already sell integrated application sets.

Revised stream

D&B Software declined to comment on SmartStream Release 3.0. But some observers said that in addition to the new software, the release will include upgrades to current SmartStream components.

"It looks pretty good," said Doug Gosling, manager of financial systems at Ontario Hydro in Toronto. He was briefed on the decision-support module of Release 3.0 last week. "The product has reached a level where they are concentrating on performance improvements. That's comforting," he added. "We aren't sitting here waiting for functions anymore."

All through this year, SAP and Oracle continued to gain momentum and build a client/server customer base they claim is reaching the 2,000-account range. D&B Software, meanwhile, had a base of 527 as of September, its latest publicly available figure.

No card shark

Analysts said although D&B Software holds a big trump card — its installed base of more than 10,000 mainframe customers — it has not played it successfully.

"SAP and Oracle have been taking business away from [D&B Software], and a lot of it is based on the integrated suites they offer," said Clare Gillan, an analyst at International Data Corp. in Framingham, Mass.

Some D&B Software mainframe users said the company would have an advantage when they evaluate client/server products.

"We are very happy with D&B, but obviously when you make that kind of a decision, you would look at more than one company," said Susan Veal, manager of financial accounting systems at First Colony Life Insurance Co. in Lynchburg, Va.

Paging all corporate users . . .

By Michael Fitzgerald

The innocuous pager may become an essential part of the corporate messaging infrastructure in 1995.

Driving this move is the push to personal communications services (PCS), which in its low-capacity narrowband form will allow for two-way paging, acknowledgment paging and other capabilities. These features could make pagers attractive as inexpensive devices for sending and receiving quick voice and data messages.

The Federal Communications Commission last week announced the winners of its latest PCS license auctions. While these were regional licenses, at least two companies will string together enough licenses to build a nationwide network. In total, there could be as many as nine nationwide PCS paging networks by late next year.

Also, AT&T Corp.'s Wireless Messaging division will today release a new paging device that uses a menu interface to give users access to information. It will ship in February and will accommodate two-way paging networks when they begin service in late 1995 or early 1996.



Analysts said information systems executives should pay attention to these paging networks because of their potential both as adjuncts to corporate messaging networks and for new functions.

"This lets you do cheap, simple [data] messaging," said Iain Gillott, an analyst at Link Resources Corp. in Framingham, Mass. He said the coming two-way networks will likely cost more than today's more-limited paging networks but will have added features for the higher price. He also pointed to applications based on the new features that companies may develop.

"You can monitor alarm systems on the factory floor or car alarms or do remote monitoring of manufacturing plants," Gillott said. For instance, a manufacturer could have a pager embedded in critical equipment to send out a warning page if a component was going bad.

Users said they were interested in the options paging could present, depending on how the market develops. Currently, it is still unclear what PCS-based paging services will cost.

"It's a question of what else will be available and reasonably priced at that time," said Lee Nolan, senior telecommunications engineer at Travelers Insurance Co. in Hartford, Conn. Alternatives such as the Cellular Digital Packet Data protocol may drop in price enough to make a full-size, two-way data pipeline more attractive than the expected large-pipe-in, small-pipe-out paging networks, he said.

Corrections

Due to a reporting error, the story "SmartSuite for OS/2 enhanced" [CW, Nov. 7] should have stated that many of the enhancements to the individual applications contained in Lotus Development Corp.'s SmartSuite for OS/2 1.1 were made and released last April.

Due to a reporting error in the story "Project management helps airline stick to schedule" [CW, Nov. 7], Applied Business Technology Corp. was incorrectly referred to as Advanced Business Technology Corp.

The name of Digital Equipment Corp.'s new low-end PCs is Venturis, not Ventura, as stated in the chart "Digital on the desktop" in the Oct. 31 issue.

The story "Network compatibility in works" [CW, Nov. 7] contained two reporting errors. The major wireless data players are working on efforts to develop a standard application programming interface so a single application will run over any of the networks. They will use a common transport layer in the Open Systems Interconnect protocol stack to accomplish this. They are not working on a way to let their networks exchange data. Also, Research In Motion is not a Motorola, Inc. subsidiary.



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Platform	Sybase	Oracle
AT&T	Industry Leading	None
IBM	Industry Leading	None
HP	Industry Leading	None

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PC tools struggle with client/server

The challenge of building distributed applications is so daunting that it's amazing how frequently the term client/server gets tossed around in connection with PC-based tools.

Push buttons are fine for activating an office manager's desktop sales review system, and click-on dots are good for multiple-choice selection in a spot-product inventory. But user-originated events can't really form the basis for an enterprisewide application that is going to require major work executed on a server and communicated to a client.

And then there's the oft encountered claim that PC tools are creating an object-oriented system. Does the customer get polymorphism, inheritance and reuse out of them? Not likely.

With Powersoft's PowerBuilder, the underlying components of the application are Windows widgets or objects that users activate. But the application developer does not produce reusable objects tailored to the needs of his firm. He produces the best application he can from a limited set of objects, which couldn't possibly cover every conceivable situation. Ditto for Gupta's SQLWindows.

The Meta View



Client/server tool sets are less than perfect, but they do address partitioning.

Charles Babcock

The end result may be a proprietary fourth-generation language such as PowerBuilder that is interpreted when it's time to run, lagging far behind the performance of compiled code. Load it up with users and an interpretive system struggles — it takes 10 or 15 seconds to open a window, for example — and then comes to a screeching halt.

For tools to produce client/server systems, they have to generate one application that runs on different hardware platforms under different operating systems. Once created, the application has to honor the conventions of the windowing interface of different client systems. Most of all, the application should be partitionable between hardware platforms. The developer should be able to designate the parts of the application that execute on a server vs. those that go on clients.

When it comes to this partitioning test, existing PC tools fall flat. With an eye on the burgeoning Windows market, venture capital firms have backed two start-ups to fill this gap. Both 42-employee Dynasty Technologies, Inc. in Naperville, Ill., and 100-employee Forte Software, Inc. in Oakland, Calif., have received millions of dollars to create cross-platform, client/server tool sets. These tools remain immature, incomplete, less-than-perfect approaches to the client/server marketplace, but they do address partitioning.

To do so, both must create object-development environments in which developers create reusable objects of their own design. In the Dynasty environment, a developer works with frameworks and an object-oriented scripting language that gets compiled into C code. In the Forte environment, a fourth-generation object language gets complied into C++.

With Forte, the basic application is given an automatic default partition by a partitioning optimizer. The optimizer analyzes the code and partitions user interface activity to the client and server activity to the server. Forte chief engineer Paul Butterworth says he is intent on building as much application know-how as possible into this optimizer. With Dynasty, the partitioning step is manual, with the developer designating which parts of the application work on the client and server. Both of these client/server tool sets can then compile the parts for specific hardware platforms and build in the communications between the application parts without the developer getting involved in the networking details.

The generation of specific executables is done through a drag-and-drop procedure that saves the developer from the need to know hundreds of hardware-specific details. When you're thinking PC tools, think *partitioning* and the ease with which it's going to be done with your PC tool set.

Charles Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Software sells on-line

Internet provides new distribution channel for commercial applications

By Ellis Booker

Buying software across the Internet — still a rather novel way to purchase commercial applications — is becoming a more serious option as a distribution channel for software vendors and users alike.

This week, CyberSource Corp. in Menlo Park, Calif., will launch the most organized effort to date to sell software across the Internet.

The privately held start-up's World-Wide Web server, software.net, contains information on 6,500 software titles for Windows, DOS, Macintosh and Unix platforms. However, for now, just a handful of those titles are available for downloading.

▶ Only a handful of CyberSource's 6,500 shrink-wrapped titles are available for downloading. The company's Web home page can be reached at http:\\www.software.net.

"What Internet provides is an infrastructure for sending full-blown applications to users since many will have [high-speed] access to the Internet," said Bill McKiernan, president of CyberSource.

Fast access needed

McKiernan said the most likely market for software.net will be Fortune 2,000 companies, government agencies and universities, where fast (56K bit/sec. and faster) access to the Internet is the rule. Fetching full-blown applications using dial-up modems is still rather impractical, he said, noting that a 5M-byte application, for example, takes about 52 minutes to download at 14.4K bit/sec.

"We haven't had that critical a need for software ... but I can see how it could help if you needed a patch," said Mike Clark, network manager at the William Morris Agency, Inc. in Beverly Hills, Calif.

But analysts said the target markets will appreciate the fast delivery. "It means the ability to get stuff at 2 a.m. or get those patches in 20 minutes as opposed to waiting six weeks to get the disks in the mail," said Daniel Dern, an Internet analyst and author in Newton, Mass.

"There's a huge potential for software distribution ... for the right kind of software," said Jay Batson, an analyst at the network strategy service at Forrester Research, Inc. in Cambridge, Mass.

Batson noted that software companies will have to rethink their products to make them suitable for on-line distribution. Creating software that is self-documenting and easy to install without disks will be key, he added.

One impact of on-line distribution will be felt by small software companies, which may be able to compete more effectively without expensive distribution channels, said Shikhar Ghosh, president and founder of Open Market, Inc. in Cambridge, Mass.

Open Market unveiled its own Internet "mall" late last month and has a facility for downloading software to paying customers.

Software vendors privately say they are unsure how big a channel on-line distribution will become, but some are working on rearchitecting their products to take advantage of it.

For instance, Gupta Corp. in Menlo Park, Calif., is looking at document viewer technologies that can show formatted documentation on-line, said Phil Ressler, Gupta's vice president of corporate marketing. He said the company will pick a viewer by the end of the year.

For the past several weeks, Gupta has had an Internet-connected server from which customers can look at product literature or download demonstration software.

Gupta is one of four software publishers whose products will be available for on-line downloading from software.net, CyberSource said. The others are On Technology Corp. in Boston, FTP Software, Inc. in North Andover, Mass., and Symantec Corp. in Cupertino, Calif.

Users will be able to download software from CyberSource's server or order it for overnight shipment. Users can submit credit-card information on-line or via a toll-free number.

Prodigy announces Internet service. See page 81.

Internet acrobatics

The question of whether commercial software can be sold over the Internet already has an answer from Adobe Systems, Inc. in Mountain View, Calif.

"We think [the Internet] is a viable distribution channel now," said Rob Babcock, senior product marketing manager at Adobe.

At the end of last month, the company posted its Adobe Acrobat Reader software on more than 100 on-line services as well as on its own new World-Wide Web server — http://www.adobe.com.

Acrobat, available for Windows, DOS, Macintosh and Unix platforms, lets users view, navigate and print documents created in Adobe Portable Document Format (PDF), a file format that preserves the look and feel of electronic documents across computer platforms and output devices. It retails for about $20.

How many hands the free software will reach is impossible to say, but Adobe officials said last week that their Web server responded to more than 7,000 download requests in the first week.

Adobe executives said they hope the reader becomes widely distributed to promote sales of the company's authoring tools, which create documents in Adobe PDF.

"Users told us they would not be willing to put documents in PDF unless they could be sure the recipients had the software to view them," Babcock said.

— Ellis Booker

Internet security fears spur action

By Gary H. Anthes

While everyone talks about commerce on the Internet, users who are worried about privacy and security avoid it in droves. Last week, several companies took steps to help alleviate those worries.

Microsoft Corp. and Visa International, Inc. have teamed to develop software that would allow credit-card holders to encrypt their card numbers and other information sent across the network. The companies pledged to publish the specifications so other vendors could build compatible systems.



Meanwhile, Premenos Corp. in Concord, Calif., and Cisco Systems, Inc. in San Jose, Calif., announced a pilot project they said enables secure electronic commerce, including electronic data interchange, on the Internet. It will be fully operational early next year, the companies said.

Both vendor alliances are using public-key cryptography from RSA Data Security, Inc. in Redwood City, Calif., for authentication, confidentiality and nonrepudiation.

Safe and secure?

Dan Schutzer, director of advanced technology at Citicorp, would not comment specifically about the two announcements but agreed that lack of security is a major impediment to Internet commerce. "Today's Internet is wide open," Schutzer said. "People put viruses in, steal mailbox IDs and all sorts of things. Clearly those issues have to be addressed, and everybody making claims about how they are going to help commercialize the Internet is attempting to address security."

Encryption, Schutzer said, "is a necessary ingredient, but it is not sufficient. You need a systems approach. You have to study the protocols, the way [encryption] keys are distributed [and] the way you enforce your internal operations to make sure there are no insiders and so forth."

Microsoft's Windows offering will consist of client software running on buyers' PCs and server software running on Visa's VisaNet payment system.

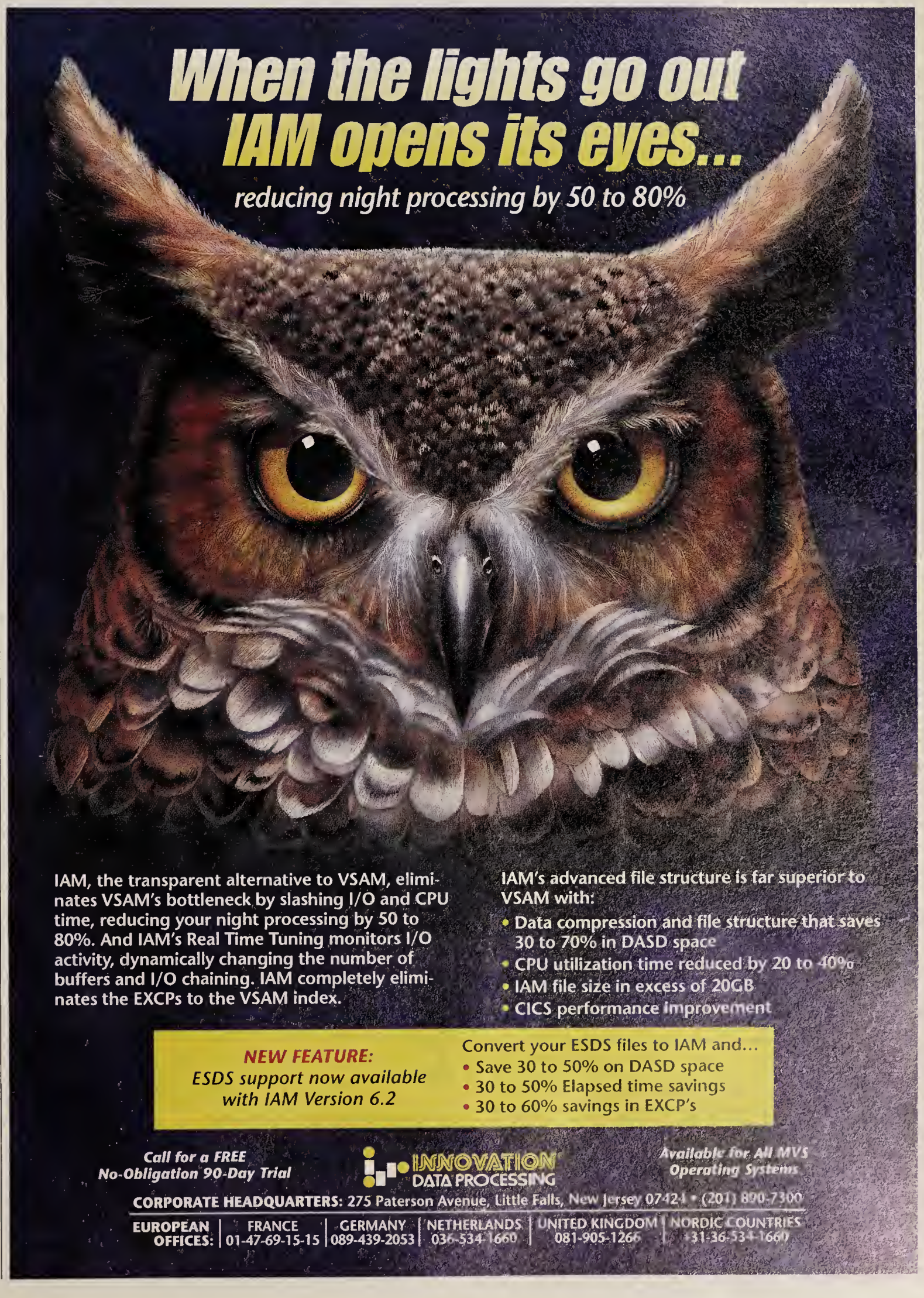
"When you place an order, all information will be automatically encrypted and signed with an RSA digital signature so it can't be altered en route," an RSA spokesman said. "You authenticate and encrypt individual transactions that travel over the 'net instead of trying to secure the connection itself."

The RSA spokesman said the technique also offers nonrepudiation so a credit-card user cannot later deny that he made a purchase.

"These [announcements] are excellent," said M. E. Kabay, director of education at the National Computer Security Association in Carlisle, Pa. "This is very much what we need, and we need to extend this to all forms of [network] access."

However, Kabay warned that some users will send credit-card numbers and passwords over the Internet unencrypted, and they will get burned. "I'm confident that before things get better, they will get worse," he said. "Commercial pioneers on the Internet will have some spectacular thefts."

Users want Internet access, but IS managers aren't sure. See page 81.



News Shorts

IBM shuffles top executives

IBM last week used a management change to signal its readiness to heat up its lukewarm interest in the interactive services market. The computer giant transferred control of its recently formed Networked Application Services division and the IBM Global Network to Dennie Welsh, who heads the company's outsourcing subsidiary and its new vertical industry sales and marketing units. The two network-oriented operations previously reported to James Cannavino, IBM's chief strategist. An IBM spokesman said the change reflects "a shift from the start-up phase to a more operational role" for those units.

Compaq beats IBM PC Co. in shipments

IBM PC Co. will not regain the top spot in the PC industry this year after all, according to the latest projections from International Data Corp. in Framingham, Mass. After trailing behind market leader **Compaq Computer Corp.** in worldwide sales for most of the year, IBM is expected to finish second, with projected sales of its PCs, servers and portables at 4.46 million units. Compaq is expected to close out with 4.75 million units sold; **Apple Computer, Inc.** takes the third spot with 4.2 million.

San Diego utility inks outsourcing deal

San Diego Gas & Electric has entered a five-year outsourcing deal with **Computer Sciences Corp.** valued at an estimated $60 million. Computer Sciences is taking over mainframe operations for the $1.8 billion utility. And two weeks ago, IBM's **Integrated Systems Solutions Corp.** and **PECO Energy Co.** in Philadelphia entered a 10-year deal [CW, Nov. 7].

Cray, other supercomputers to debut

Cray Computer, Inc. said its Cray-4 machine will ship in four- and eight-processor versions during the first half of next year. **NEC Corp.** introduced its SX-4 into the U.S. market, with shipments scheduled to start in the fourth quarter of next year. On Thursday, **NCube** will unveil the new NCube 3 massively parallel processor for shipment to scientific customers in the second quarter of next year.

Native American veterans honored

One of the oddest stories from World War II was that of the "Code Talkers," a top-secret, 18-member military unit comprising Native Americans from the Comanche and Navajo tribes. They used the Comanche language, which has no alphabet or written record, to confound Axis intelligence officers. Now, an **AT&T Bell Laboratories** employee has developed a software program that can reconfigure a PC keyboard so people can type using the Comanche language.

SHORT TAKES Stephen C. Rood, 43, director of information technology at **Coopers & Lybrand**'s New York office, has left the Big Six accounting firm to become director of information technology at **M. W. Houck, Inc.**, a Montvale, N.J.-based food broker. ... **Canadian Airlines** has outsourced its entire reservation, internal management and control systems to **AMR Corp.**'s Sabre Computer Services Division under a 20-year services agreement. ... **Microsoft Corp.** said its Systems Management Server is still on target to be shipped Nov. 30. Separately, the company has hired Robert I. Herbold, an executive experienced in both consumer marketing and information systems, to be its chief operating officer. ... **Sun Microsystems, Inc.** said last week that it will finish porting Microsoft's Windows NT to the SPARC platform, now that Intergraph Corp. has completely dropped out of the year-old effort

Management strategies

Unocal's outsourcing decision stirs up networking operations

By Steve Moore

The day they were asked to open their car trunks for inspection before driving off company property in Anaheim, Calif., Unocal Corp. employees realized the rumors were true.

The beefed-up security meant that the $10 billion oil and energy company was about to launch a major outsourcing initiative that would affect all computer and network support groups — from the desktop to the mainframe and from the LAN to the WAN.

Unocal's outsourcing move, which came amid similar information systems downsizing efforts at other large oil companies [CW, Aug. 22], is part of a companywide effort to cut costs and pare staff by 40% — from 1,540 employees to 900 within two years, Unocal spokesman Barry Lane said last week. He said 130 of the layoffs will occur within Unocal's IS group.



Unocal's Peter Ho *said outsourcing will probably mean dismantling the company's network operations center*

The consequences

One immediate effect of the outsourcing decision was the withdrawal of a request for proposals (RFP) for an integrated network management system. The new system was slated to tie together all the disparate management consoles in Unocal's network operations center.

Forced to cancel scheduled interviews with vendors on his RFP shortlist, Peter Ho, supervisor of network architecture and software services in Unocal's telecommunications department, could do nothing but wait. An outsourcer is not expected to be chosen until late this year or early next year, he said.

Once under way, making the transition to a different infrastructure could take as long as eight months, Ho noted.

Outsourcing targets

Lane said the specific functions to be outsourced are the IBM mainframe data operations, the help desk and the WAN. The local desktop computing, LAN management functions and personnel will be moved out of corporate IS and distributed to individual business units, he said.

Meanwhile, Ho and other Unocal employees can only speculate about their fate. Once an outsourcer heads into a company, Ho noted, the current employees feel at a disadvantage. "No matter how good you are ... you may not be viewed as respectfully as if you came in the front door," he said (see story below).

As a result of recent improvements in vendors' remote network monitoring and management services, senior managers have to ask why they should maintain internal assets when they can cut costs by divesting them, said Jeff Kaplan, a director at Dataquest, Inc.'s Worldwide Services Group in Framingham, Mass.

Who's running the show?

In Unocal's case, Ho said the company's modern network operations center — completed little more than a year ago — will probably be dismantled. The outsourcer would likely run Unocal's network from a remote site where other companies' networks are also managed especially because Unocal now may relocate its headquarters, he added. Users and industry analysts agreed that the trend toward outsourcing shows no signs of fading.

"Outsourcing is a trend that will continue because today's marketplace is so competitive," said Nancy Wong, manager of computer and network operations at Pacific Gas & Electric Co. in San Francisco. "The market for outsourcing systems development is deeper and wider because it is not as asset-intensive as operations," she said, adding that PG&E currently does only very targeted outsourcing of specific projects.

"The outsourcing market is surging, and the contracts are getting bigger," added Stephen McClellan, first vice president at Merrill Lynch & Co. in San Francisco. "In the first nine months of this year, new outsourcing megacontracts worth more than $100 million each have already reached a total of $12.8 billion."

That compares with $10.2 billion in similar-size contracts during all of 1993, McClellan added, noting that the market is growing at a 40% clip.

Managers of distributed networks gain control with new products. See page 86.

What outsourcing means for employees

Employees in an outsourcing situation face the following possible outcomes:

- Staying with their current company to aid in strategic planning or managing the outsourcer relationship.
- Being picked up by the outsourcer.
- Being laid off.

In the first two scenarios, employees risk having the outsourcer pick their brains for a few months and then being laid off anyway, users and analysts said.

For IS professionals caught up in an outsourcing deal, the best strategy is to work toward a win/win outcome through a "cosourcing" arrangement, said Jeff Kaplan, a director at Dataquest's Worldwide Services Group.

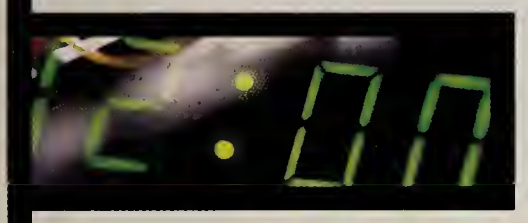
A close watch

With cosourcing, key in-house staffers are retained to ensure that the outsourcing arrangement is launched successfully and stays on track in the long run.

"Cosourcing, rather than outsourcing, is more likely to ensure day-to-day uptime and long-term optimization," Kaplan said.

— Steve Moore

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EMC "RAIDs" client/server arena

By Mary Brandel

EMC Corp. is the darling of the mainframe storage world. Now, with the announcement last week of its Centriplex disk array, it wants to be the kingpin of client/server storage.

With one blow, the $1.3 billion storage vendor delivered 54G to 810G bytes of redundant arrays of inexpensive disks (RAID) storage to client/server environments — the most storage you can buy in a single 7-sq.-ft. cabinet.

Analysts were impressed by the mainframe-like functionality of the system. In addition, its 512M bytes of cache memory bode well for performance, they said.

Most important, the $215,400 to $948,650 Centriplex stores data simultaneously from up to nine heterogeneous servers running Unix, OS/2, Microsoft Corp.'s Windows NT, Novell, Inc.'s NetWare and Banyan Systems, Inc.'s Vines.

"For what I have on my floor right now, that would be an ideal solution," said Steven Petrillo, systems technology specialist at Minolta Corp. in Ramsey, N.J. An EMC customer, Minolta plans to have 20 servers at its headquarters and a dozen more across the country. "I'm looking at storage from a centralized point of view," Petrillo said.

Other lower-end client/server storage systems, including Digital Equipment Corp.'s StorageWorks, Data General Corp.'s Clariion and IBM's 7137 Disk Array Subsystem, operate in numerous environments but not simultaneously.

Avalanche

EMC's Open Storage Group is positioning itself for PC LAN and Unix server storage, both hot growth areas

AVERAGE ANNUAL GROWTH RATE OF STORAGE

PC LAN	86%
UNIX SERVER	37%
MAINFRAME	20%

Source: Peripheral Concepts, Inc. Santa Barbara, Calif.

There are advantages to centralizing storage. For instance, RAID is not something users can easily justify unless they can pool the data from PC LANs (with average capacities of 2.5G bytes) with Unix servers (which average 8G bytes), said Farid Neema, an analyst at Peripheral Concepts, Inc. in Santa Barbara, Calif.

And with Centriplex, users can select RAID Levels 0, 1 or 5 for different types of data.

Of course, not everyone plans to centralize all of their storage, particularly if LANs are distributed over a wide-area network. That is why EMC will first hit on its mainframe customers who are gaining responsibility for LAN and database server storage.

"We're selling to companies with 250G bytes to multiple terabytes at a time," said Jeffrey Allen, vice president of marketing at EMC's Open Storage Group. Data warehousing and decision-support applications are primary targets.

Those sales alone could mean $200 million in revenue in the product's first year, EMC said.

EMC will also be aided by its reputation in mainframe storage. Starting from zero in 1990, it has leapt to a 26% share of mainframe terabytes shipped today, according to International Data Corp. (IDC) in Framingham, Mass. It now stands just below IBM at No. 2.

What is not yet available for Centriplex is management software. Hierarchical storage management and backup software will be provided in the first half of next year by EMC's subsidiary Epoch, Inc., the company said.

"Software will be an important component for EMC to be overwhelmingly successful in the future," said Robert Callery, an analyst at IDC.

A low-end $215,400 model has 54G bytes of storage, 32M bytes of cache and six SCSI channels. For $948,650, users get 360G bytes of storage, 384M bytes of cache and 16 SCSI channels. Shipment is expected to begin this quarter, with volume production beginning in January.

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Interconnectivity

Cisco offerings to bring remote office users improved links with IBM hosts

By Suruchi Mohan

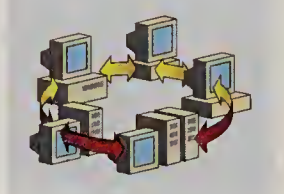
Cisco Systems, Inc. will this week announce a slew of products designed to provide users in remote branch offices with better connectivity to the IBM host-based world.

Perhaps most significant is the introduction of Data Link Switching Plus (DLSw+), Cisco's proprietary flavor of DLSw. The DLSw is an IBM Advanced Peer-to-Peer Networking Implementors' Workshop (AIW) standard that only a week ago reached the second stage in AIW's three-stage approval process.

A link between worlds

From an end-user perspective, "DLSw+ is most strategic," said Glenn Gabriel Ben-Yosef, a senior analyst at The Yankee Group in Boston. "You have the same capabilities with other companies; DLSw+ will provide added functionality to attack the pervasive problem that DLSw is supposed to solve" — namely, the linking of the SNA and TCP/IP worlds.

DLSw is a way of encapsulating SNA traffic over a TCP/IP network; it includes flow control — making sure no router gets inundated with traffic — and prioritization. These functions, Cisco claims, already exist in the routers that support Remote Source Route Bridging (RSRB), which is the way the company currently sends SNA traffic over TCP/IP.



On the horizon

Cisco has also introduced the Downstream Physical Unit concentration, a software feature that allows routers to handle SNA/LAN gateway functions.

Adding the missing piece

But according to Donna Kidder, product manager for IBM internetworking at Cisco in Raleigh, N.C., the key feature missing in DLSw is the scalability to several thousand routers required to construct a large network. DLSw+ is an attempt to provide this functionality.

With DLSw, if users want any-to-any communications, they have to connect every router on the network with every other over a TCP/IP link. When one router has to exchange information with another, it sends a message to all routers.

DLSw+ breaks that large network into smaller groups, essentially changing the flat architecture of the DLSw to a hierarchy. In the new configuration, a group of access routers, usually installed in branch offices, are connected to a border peer router. All border peers are connected to one another but not to all the routers on the network, thereby cutting down on the amount of traffic that goes over the backbone when routers have to exchange information.

"Standard DLSw is an important standard for routers," said Audrey Apfel, a research director at Gartner Group, Inc. in Westport, Conn. Because of Cisco's initiative, many router vendors will have to enhance the DLSw standard.

"We will see lots of vendors offer enhanced encapsulation as well as standard," Apfel said.

Open to all

Cisco, for its part, will offer DLSw+ features to the appropriate standards bodies so other vendors can write to the specification. Kidder said DLSw+ will be fully compliant with the DLSw standard and backward-compatible with RSRB. Cisco promises an easy migration path, and existing customers will get the upgrade free of charge.

Another key feature in Cisco's IBM internetworking strategy is SNA support for frame relay. This means users in remote offices who use Synchronous Data Link Control (SDLC) links to connect to a host can now make the same connection over frame relay, substantially lowering costs.

This is important in branch networks, where these solutions fit best, Apfel said. "Branches have mission-critical SNA running over low-speed [SDLC] links. Frame relay works very well there," she said.

Additionally, Cisco has announced a software architecture, called the Native Client Interface Architecture, that provides a new way to connect client PCs to IBM mainframes.

HP teams with Lotus on Notes

By Lynda Radoscvich

Lotus Development Corp. and Hewlett-Packard Co. last week announced their widely anticipated pact to jointly develop and market Lotus' groupware and messaging products.

Mulling it over

Lotus Chief Executive Officer and President Jim Manzi would not comment on plans to bundle Notes, HP's OpenView and Oracle Corp.'s Oracle database with HP/UX. But he hinted at such a deal, saying it presented an "interesting opportunity."

The alliance is part of a broader effort by Lotus to seed the high-end server market with Notes and change the Notes image from that of a small workgroup technology to a large-scale communications platform. The pact calls for HP and Lotus to do the following:

- Bundle Notes Release 3.2 on all HP 9000 Series 800 HP/UX servers, beginning in December.
- Deliver NotesView, a Simple Network Management Protocol application for the HP OpenView network management platform, early next year.
- Immediately team on consulting services and let HP resell Notes.
- Integrate the forthcoming Lotus Communications Server (LCS) and HP OpenMail starting with the OpenMail Exchange Facility for Notes, a mail exchange gateway due in the first quarter of 1995.

Analysts said the plans to integrate OpenMail and LCS signal that HP is conceding the messaging market to Lotus. OpenMail is the primary client/server messaging system on the market today, but HP has had trouble marketing it, the analysts added.

HP said it will continue to develop OpenMail for current customers and simultaneously offer a migration path to LCS. Beyond the Exchange Facility gateway, LCS and OpenMail integration will wait until after the first version of LCS ships in mid- to late 1995. The agreement will not affect the first version of LCS or its expected delivery date, Lotus said.

Also, HP officials said the company will license $15 million worth of Lotus software such as CC:Mail, Notes and desktop programs in the next three years.

The Premier 100

Manhattan's famed Essex House was the site of Computerworld's *annual Premier 100 dinner earlier this month, honoring the most effective users of information technology*





PHOTOS BY REINHOLD SPIEGLER

Premier 100 winners pictured from left to right: Dale Phillips, VP and CFO, Illinois Central Corp.; Jerry Moore, VP, Unifi, Inc.; John Kallelis, VP of information technology, Aramark Corp.; Bruce Whetstone, director of corporate information, Amgen, Inc.; Jeff Kostiw, VP, manager of information technology, MBIA, Inc.; Bill Davis, assistant VP of platform development, U.S. Healthcare, Inc.; and Donald Cerullo, VP of corporate MIS, UST, Inc.

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Mobile gear gets dressed up for expo

By Michael Fitzgerald

Road warriors take notice: A number of updated or enhanced mobile products will come to light this week at Comdex/Fall '94.

Hewlett-Packard Co. has fixed the main flaws in its OmniBook subnotebook and will finally offer full-size notebooks with the introduction of the OmniBook 4000.

E-mail, voice mail and paging will come together in Wynd Communications Corp.'s WyndMail for Windows.

The new subnotebook OmniBook 600 corrects the backlight problems of earlier models by using a dual-scan, passive-matrix color screen. Performance limitations are being addressed by adopting Intel Corp.'s 25/75-MHz DX4 chip. Storage capacity will also be boosted with up to a 260M-byte 1.8-in. hard drive. The new product also maintains the 3.8-pound weight but only has four hours of battery life, down from eight hours.

The OmniBook 4000 was designed by HP and Taiwan's Twinhead International, Inc. and is full-featured. It will be available with either the 25/50-MHz 1486DX2 or the 33/100-MHz DX4 processor and up to a 520M-byte hard drive. Prices start at $2,599 for the OmniBook 600 and $3,299 for the 4000.

Mobile remakes

Several vendors have updated current products for Comdex, as well.

Texas Instruments, Inc. is releasing the TravelMate 4000M/100, using Intel's 100-MHz DX4 as well as hardware to support full-motion video and sound. Prices start at $5,599. **NEC Technologies, Inc.** will put Pentium in its Versa line. **Sharp Electronics Corp.** will show two new notebooks with multimedia capabilities, built-in infrared communications and a GlidePoint finger mouse. **Revered Technology, Inc.** will update the Power Cruiser, whose distinguishing feature is a display that can be pulled off and used as an LCD panel for overhead displays.

Meanwhile, **Panasonic Personal Computer Co.**, which makes the V41 and V21 notebooks with integrated CD-ROM drives, landed its first major distribution deal when **MicroAge, Inc.** said it would distribute its notebooks.

Wireless messaging will see some advances on the peripheral side. **NovaLink Technologies, Inc.** in Fremont, Calif., will ship the NovaPak 144, a $449 PC card that combines a cellular data/fax/voice modem and a pager. **Toshiba America Information Systems, Inc.** will add a cellular data/fax modem to its Noteworthy line of PC cards. **Research In Motion** in Waterloo, Ontario, will introduce a radio modem for **RAM Mobile Data USA L.P.**'s Mobitex network, following last week's release of MPT, a RAM Mobile Data terminal. Also last week, **Skytel Corp.** began shipping the VersaPage card for NEC's Versa notebooks.

Customers should look for a slew of PC cards at Comdex. Among them will be **Cardwell International Corp.'s** combination Sound/SCSI-2, available in February for $349.

Several other announcements advancing the mobile market also occurred last week. **Toshiba** announced a 1.08G-byte, 2½-in. drive, the MK-2728, which will cost vendors $699 and ship in the first quarter of next year. Toshiba also introduced an 810M-byte drive, due out in December. **Samsung Semiconductor, Inc.** entered the market for thin film transistor, active-matrix color displays, introducing four displays that will be produced in volume next year.

On the road to mobile computing? Ted Prince doesn't think so. See page 79.

Taligent to push a late Tal AE, object-oriented apps

By Ed Scannell

Taligent, Inc. will use Comdex/Fall '94 to tout the latest progress made with its Taligent Application Environment (Tal AE) even though company officials said its first beta will not be available until February — not by year's end as promised.

Tal AE *is now named Common Point*

The slight delay is not expected to significantly push back final delivery of Tal AE, which Taligent has renamed Common Point. Nor will it dramatically affect delivery of the other operating systems pieces — including the Taligent Development Environment and the Taligent Object Services — both of which are expected by the end of next year, said Joe Guglielmi, president of Taligent.



HANK DE LESPINASSE

Taligent's Joe Gugliemi: *Tal AE will be a full-featured beta*

"We have another 90 days' worth of work before [Tal AE] is fully cooked, but it will be a features-complete beta," Guglielmi said.

Also slated for demonstration are early versions of a half-dozen applications from third parties and corporate developers. Some were coauthored by Taligent, and some take full advantage of the object-oriented environment.

Three of the applications are notable.

- In one of the first end-user applications to be shown, the University of California at Los Angeles will demonstrate a prototype that allows technical researchers to work on complex simulation programs in real time.
- A workgroup application codeveloped by Adamation, Inc. and Taligent gives users a place to electronically "come together" to share data and complete joint projects in real time. The product is called Meeting Place.
- A data access framework codeveloped by Taligent and Brio Technology, Inc. allows desktop users to access host-based databases such as DB2, Oracle Corp.'s Oracle and Sybase, Inc.'s Sybase.

Taligent will also announce a certification and testing program to ensure that any application developed under the Tal AE will run on multiple operating systems, including OS/2, Macintosh and Hewlett-Packard Co.'s HP/UX.

Next delivers objects framework. See page 119.

Almost as good as being there

Can't make it to Las Vegas? Not to worry — you're just a disk away from finding out what's hot at Comdex. Audio Computer Information (ACI), a Spring Grove, Minn.-based maker of educational tapes, is offering product snapshots, reviews, pricing and manufacturer contact details as well as editorial comment from a syndicated columnist on a 3½-in. disk.



The ACI disk will be available after Comdex for $4 and can be freely duplicated for distribution over the Internet for internal corporate purposes, according to an ACI spokesman.

—Jaikumar Vijayan

DOS compatibility

Apple puts Windows on Power Mac 6100

By Mark Halper

Apple Computer, Inc. this week will unveil a 486 add-in board that will turn Power Macintosh computers into Windows machines, but there will be at least one catch: The board will work with only one of three models in the Power Macintosh series.

The 66-MHz 486DX2 DOS Compatibility Card is faster than both the 33-MHz 486SX board that users had anticipated [CW, Nov. 7] and the 50-MHz board that Apple has been demonstrating for months. Apple has tentatively set pricing at $699. The board will include a PowerPC 601 processor as well as the 486 chip. It will support Creative Labs, Inc.'s Soundblaster chip set as well as TCP/IP and Novell, Inc.'s NetWare.

The card's physical design, however, will limit it to the Power Macintosh 6100. Apple product manager Jim Gable explained that the board plugs into the Power Macintosh's processor direct slot, which Apple uses in the 7100 and 8100 to house video cards. It is not feasible to design a board to fit in the expansion slots in the 7100 or 8100 because those slots tie into Apple's Nubus system bus, which is not fast enough for the card, Gable said.

That ole magic

The new card marks Apple's second x86 add-in product. An earlier board, called Houdini, lived a short life after Apple discontinued the Quadra model that housed it.

Apple will also introduce the 6100 DOS Compatible system, which is a 6100 Power Macintosh equipped with the board, at an "anticipated Apple price" of $2,499 for the system. Both the card and the new system are slated for first-quarter availability.

In keeping with ever expanding desktop memory requirements, Apple is recommending the card be installed in systems with a minimum of 16M bytes of RAM and said it will probably outfit its 6100 DOS Compatible system with that amount of memory. The system will also have an Apple SuperDrive floppy drive and a 350M-byte hard drive.

Apple has licensed the board technology to Reply Corp. in San Jose, Calif., which will make versions for 680x0-based Macintosh systems.

Expo showcases chip advances

RISC, Pentium, dual-processor are big draws

By Jaikumar Vijayan

■ In a flurry of announcements based on Intel Corp.'s Pentium processor and other high-end RISC chips, several hardware vendors this week will showcase the coming generation of desktops and servers at Comdex/Fall '94.

Among the technologies featured will be Peripheral Component Interconnect (PCI); Plug and Play; multiprocessor support; flexible, processor-independent designs; integrated multimedia capabilities; faster data-transfer speeds; larger memory and storage capacities; and raw processing power.

"The original hype machine is in full gear — Pentium, PowerPC, Windows 95 and OS/2" will be the focus of a lot of attention at this year's show, said Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass. Multiprocessors will also draw attention, analysts said.

Comdex will feature the industry's first processor-independent box — UniFlex from DeskStation Technology, Inc. UniFlex will feature a swappable, CPU-independent motherboard that hosts RISC or complex instruction set computing, microprocessor-specific daughter cards. Initial modules will be available for Mips Technologies, Inc. processors and Digital Equipment Corp.'s Alpha chips. Later versions will offer swappable PowerPC and Intel processors.

Introductions galore

The show will also include the following announcements:

- **Compaq Computer Corp.** will announce the 90-MHz, Pentium-based ProSignia 500 PCI/Extended Industry Standard Architecture server. It features Compaq's TriFlex/PCI architecture, integrated 32-bit Ethernet support, up to seven 2.1G-byte "fast" SCSI-2 drives, 256K bytes of second-level cache, swappable processor boards for upgrades, network management software and a starting price tag of about $5,400.
- **AT&T Global Information Solutions** will unveil two dual-processor Pentium-based PCI boxes: the 3416XL 90-MHz, Pentium-based LAN server and the 60/66-MHz-based 3404 desktop server.
- Similarly, **Dell Computer Corp.** will show off its first PCI-based dual-processor Dell PowerEdge SP-2 and XE-2 network servers. They offer a 90- or 100-MHz Pentium processor, 16M bytes of RAM, 256K bytes of cache, a 1G-byte SCSI hard drive, redundant arrays of inexpensive disks (RAID) support and a new server management system. The starting price for a 90-MHz Pentium system is roughly $6,598. A second processor will add $940 to the price tag.
- **Advanced Logic Research, Inc.** will unveil a dual-Pentium processor version of its Revolution series of multiprocessor systems. The Revolution Q-2SMP server features 512K bytes of second-level cache, 32M bytes of error correction code memory, 1G byte of local-bus graphics, double-speed CD-ROM drives, 32-bit SCSI-2 RAID support and 15 device bays. The starting price is $13,686.
- **The Video Electronics Standards Association** (VESA) will meet to determine hardware standards for set-top boxes. VESA hopes to present a proposal for a general architectural standard to the Federal Communications Commission by the end of first-quarter 1995.

Comdex will also feature two RISC-based offers aimed at the Microsoft Corp. Windows NT market: the RISCserver 2200 symmetrical multiprocessing server from NEC Technologies, Inc. and the Fastseries line of dual-processor personal workstations from NetPower, Inc.

Also, Taiwanese manufacturer Tatung Co. will demonstrate the TPC-5540 and TPC-5740 systems, based on the 100-MHz PowerPC 604 chip.

Users awaiting right price to buy Pentium- and Alpha-based PCs. See Guide, page 139.





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MOTOROLA

Object-oriented CICS coming in '95 for OS/2

By Craig Stedman
ATLANTA

IBM's CICS transaction processing monitor is going object-oriented. But users should not hold their breath in anticipation.

It will be late 1995 or early 1996 before the venerable CICS starts getting underlaid with an object-oriented development framework that replicates its application programming interface, according to Geoff Sharman, manager of distributed on-line transaction processing strategy at IBM.

The framework will include foundation class libraries of objects that should speed programming by allowing CICS developers to escape from the rigors of using procedural languages such as Cobol and C, Sharman said here last week at the Guide International Corp. user group conference.

Get your CICS in '95

IBM plans to make a series of CICS-related product introductions early next year

CICS for Windows NT

Direct port of CICS OS/2 code to Windows NT 3.5. Now in beta testing.

CICS/6000 Version 1.2

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However, the initial rollout will be limited to the OS/2 version of CICS and will mainly target the client level. "The server will take a while longer to crack," Sharman said. Also, IBM does not have a solid schedule for adding object support to its mainframe, AS/400 and Unix CICS implementations, he added.

Cautious interest

CICS users at the conference were intrigued by the prospect of gaining access to object technology. But they said skepticism is in order until IBM actually delivers the goods.

"Objects are becoming a requirement in our shop, but it really depends on what IBM puts out," said Ezriel Gross, a software systems consultant for transaction processing at Metropolitan Life Insurance Co.'s Parsippany, N.J., data center. "I've heard lots of good talk from IBM before."

Object libraries provided by IBM would help prevent various departments from creating their own "islands of foundation classes" that would be incompatible with one another, said one user, who asked not to be identified. Application developers at his company "look at CICS as old technology," he added.

Dave Hudson, director of market research at The Standish Group International, Inc. in Dennis, Mass., said opening up CICS to object-oriented, fourth-generation language tools such as IBM's VisualAge and VisualGen products should help reduce the amount of time needed to develop applications. Another benefit should be improved reliability.

According to The Standish Group, most transaction monitor vendors will start to support objects in 1996. Joe Menard, vice president at Novell, Inc.'s Tuxedo Systems Group, confirmed that Novell is working on capabilities similar to what IBM is planning. Menard would not specify a delivery time frame but said he doubted IBM would have much of a lead.

In addition to the CICS class libraries, IBM plans to provide an interface to its System Object Model, plus support for remote objects and desktop object frameworks such as OpenDoe and Microsoft Corp.'s Object Linking and Embedding 2.0, Sharman said. The Object Management Group's Common Object Request Broker Architecture will also be implemented eventually, "but that's maybe looking a little further ahead," he said.

Dressing up Tuxedo

Novell last week tried to bulk up its Unix-based Tuxedo transaction monitor to handle larger installations. The Provo, Utah, networking vendor introduced an updated System 5 release with support for grouping users into multiple small domains, which can be kept separate for administration and security purposes.

The domains could then interoperate via messaging, allowing a much larger number of servers to be supported than before, said Joe Menard, vice president of Novell's Tuxedo Systems Group. Tuxedo typically maxes out at about 50 servers now, while System 5 should handle 1,000 or more, Menard said.

Holiday Inn Worldwide is developing a Tuxedo-based application for optimizing bookings at its 1,800 hotels. Mark Marcus, manager of advanced applications at the Atlanta-based company, said he views the domains capability as a necessary tool for improving both scaling and security.

Currently, users can access any application or service in a Tuxedo installation, "and that's pretty scary," Marcus said. However, he added that Holiday Inn will probably "let somebody else get beat up on [Tuxedo System 5] for a while" before converting over to the new software.

System 5 is due to ship in late December. Other Unix transaction monitor vendors such as AT&T Global Information Solutions and Transarc Corp. already have similar domain capabilities. IBM is expected to improve management features in its CICS/6000 software next year, said Dave Hudson, director of market research at The Standish Group. For now, CICS/6000 still has a single name space, he said. — *Craig Stedman*

IBM untangles

CONTINUED FROM COVER 1

customers with a single monthly bill covering all non-PC software license and maintenance fees, Hancock said.

That was exceedingly welcome news for managers at large IBM shops, who recited a litany of common complaints about existing billing practices. For example, bills come in at different times and have different formats, depending on the hardware involved, the users said. Additions or deletions of software are often missed, several customers said, and getting mistakes corrected can take months.



IBM's Ellen Hancock: *The billing system "has not been as responsive as we would like"*

"Following the bill through from when you order [a product] to when you pay for it is often an interesting experience," said Linda Mainord, Guide president and director of application services for the Memphis City Schools. "Everybody would be happy if it all came back together."

All over the place

Billing "has been at the bottom of IBM's [customer] rating list since I was there in the early '70s," said Marc Cohn, senior vice president of information systems at Enterprise Rent A Car Co. in St. Louis. "It's a terribly antiquated and convoluted system that doesn't work well for anybody."

Enterprise's bills are sent to multiple locations. The company gets some bills "that synchronize with delivery [of products] and some that don't," Cohn said. His local IBM sales representatives try to ease the confusion by collecting bills and sending them in a package, "but that's a weak system," he added.



Memphis schools' Linda Mainord: *Billing "can be difficult" due to IBM's lack of a single control point*

Galileo International in Englewood, Colo., also has a liaison at IBM who "tidies the bills up before we get them," said Paul Quade, director of capital planning and resource management at the on-line reservation consortium. But that person simply combines the bills and passes them on as is — without checking for errors, he said.

"You would think it would certainly be more cost-effective to just put a good billing system in place," Quade said. It has taken Galileo as long as two months to get maintenance charges removed from a bill when it drops a software product — in contrast to the "very precise" billing of mainframe software vendors such as Computer Associates International, Inc. and Legent Corp., he said.

Hancock acknowledged that the billing system, officially known as the Advanced Administrative System (AAS), "has not been as responsive as we would like."

AAS lived up to its advanced name when it was first developed in the late 1960s and early 1970s, said Charlie Burns, a research director at Gartner Group, Inc. in Stamford, Conn. Based at a facility in Bethesda, Md., the billing and order-entry system was "very much ahead of its time" as an early proving ground for database and transaction processing technologies, he noted.

But AAS predated the development of commercial databases such as IMS and DB2. "Now they're saddled with this thing that's not standard and has no cross-linking," Burns said. "IBM has the classic problem that many mainframe customers have: It gets tough to update the old stuff."

AAS "grew into a monster," agreed David Andrews, managing partner at D. H. Andrews Group, Inc., a consulting firm in Cheshire, Conn. IBM Chairman Louis Gerstner "came in and fixated on this as something that needed to be [changed], but it's not a simple matter to re-engineer an application that big," Andrews said.

Hancock did not comment on how AAS is being revamped but said Software Easy will be based on a combination of mainframes and OS/2 systems running DB2. IBM is putting together a unified customer database for the first time, she said.

PC software is not involved because it uses a billing system other than AAS, said Linda Hubbard, manager of software business strategy at IBM U.S. AAS was originally built for hardware billing only, and IBM is focusing on coordinating the software pieces first because of the "sheer number" of software packages most customers have, she added.

IBM's new parallel mainframes draw interest. See page 91.

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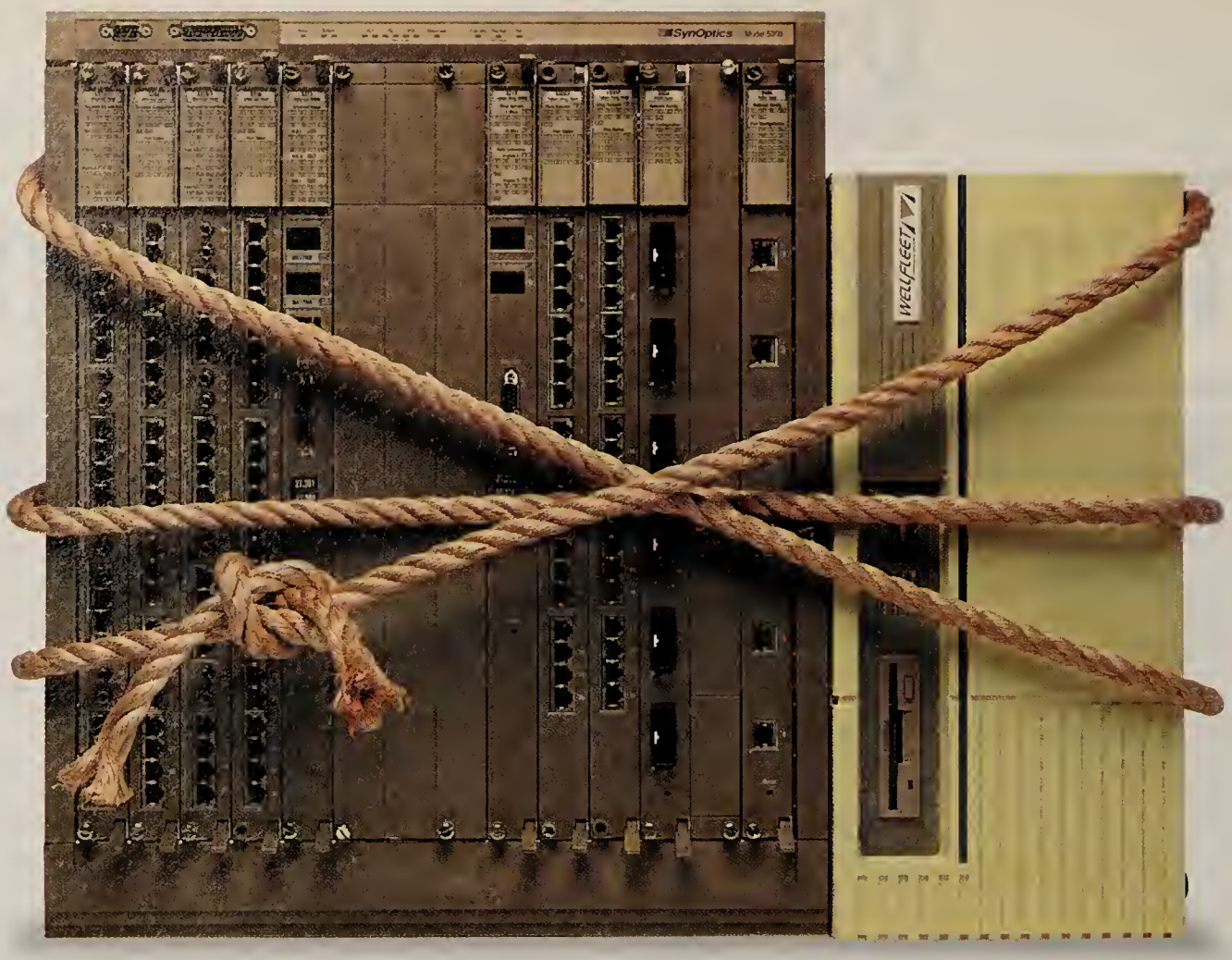
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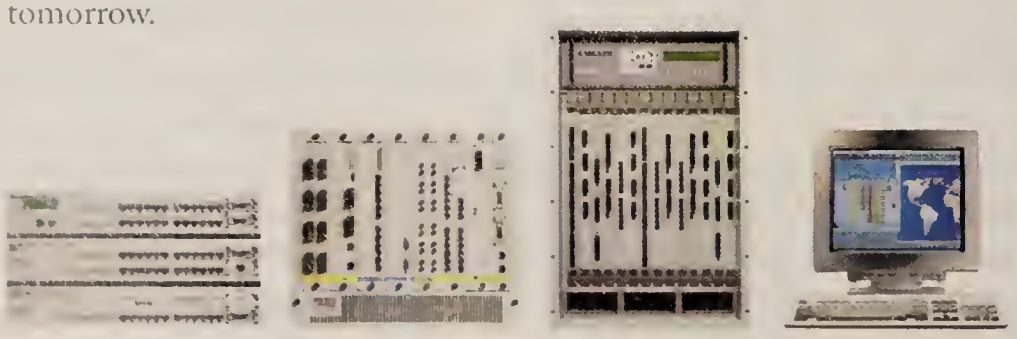
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BOUND FOR SUCCESS



User groups tackle full slate of network issues

By Suruchi Mohan

As companies leave the monolithic mainframe environment and migrate to client/server networks, many have found themselves turning to various user groups in an effort to cope with a whole new set of mostly network-related problems.

While many participants said they are happy with the impact these groups have had on the vendor community, all agree there are a few areas that still need major work. These issues, over which a number of user groups have pressed hard, include single sign-on, interoperability and licensing.

For example, Open User Recommended Solutions (OURS), an industry group that focuses on interoperability, has been working on single sign-on. The biggest problem with single sign-on has been "trying to get vendors to understand what it means," said John Wylder, group vice president at SunTrust Banks, Inc. in Atlanta.

Wylder said that while single sign-on runs the gamut from mainframes to LANs to desktop PCs, most vendors treat it as a LAN issue of logging on to an entire network. Wylder said executives at his company want to log on just once and have access to all the enterprise resources. "This makes single sign-on more complex," Wylder said. He added that he understands how hard it would be for vendors to comply with user demands, "but we want everything."

Interoperability among network applications is another issue still far from resolution, plaguing users trying to establish electronic communications with their suppliers, partners and customers, said John Grable at the corporate LAN management group at Nike, Inc. and a member of the Network Applications Consortium (NAC) in Beaverton, Ore.



ANDY FREEBERG

Pacific Gas & Electric's John Danielsen *says a common perspective reduces the time needed to negotiate contracts*

Smoothing the path

A homogeneous Banyan Systems, Inc. Vines shop, Nike is now "interested in making it as convenient as possible for business partners to communicate with us. And out there, it's very diverse," Grable said.

To make interoperability happen, user groups are exerting their influence in subtle ways. In July, for example, NAC members provided a white paper on interoperability among messaging platforms to four messaging vendors — Microsoft Corp., Novell, Inc., Lotus Development Corp. and Banyan. The group demanded that the vendors make their platforms interoperable to give users the choice of mixing and matching clients and pipelines, said Hilly Fuchs, assistant vice president of information services at Continental Grain Co. in New York.

The vendors so far have responded with "cautious volunteering," said Larry Gauthier, director of network services at the University of Michigan at Ann Arbor and NAC chairman. All vendors said they wanted to start out by focusing on a narrow facet of the technology, and all agreed on directory services, he said. If NAC could engineer some common architecture on which all vendors could agree, they would gather at some neutral site to show interoperability with other platforms, he added.

While change has been slow in the interoperability arena, it has occurred more rapidly in licensing, where at least "one vendor did a 180-degree change in policy because they were told by users that they wouldn't buy" on their terms, said Jerry Schneider, president of Schneider Associates, a consulting firm in Washington.

As an example, Julian Horwich, executive director of the Corporate Association of Microcomputer Professionals in Northbrook, Ill., noted that a few years ago, WordPerfect Corp., under pressure from users, changed its policy to offer concurrent licensing.

Working together

Getting vendors to do an about-face on an issue is not the sole reason for user participation in these groups. "Working with vendors to get a common framework for terms and conditions" for software licensing is of great importance, said John Danielsen, vice president of computer and telecommunication services at OURS member Pacific Gas & Electric Co. in San Francisco.

"Our software licensing every year runs between $20 million [and] $50 million, so to get a common perspective helps us reduce the time [needed] to negotiate a contract," Danielsen said. "A common framework is a very important piece of the business."

Charlie Dick, manager of small systems at the American Bureau of Shipping in Houston, said a big advantage of user groups is that vendors talk to customers instead of at them. Still, he added, it remains difficult to get vendors to listen to their pleas for Plug and Play interoperability.

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DEC notebooks fashionably late

By Mary Brandel

When you're late to the party, you better bring something special.

That is just what Digital Equipment Corp. did last week when it announced its first-ever notebook computers, including five full-size HiNote models and five smaller HiNote Ultras — all 486-based machines.

HiNote Ultra is the real head-turner, observers said. Weighing in at 4 pounds and measuring only 1-in. high, the highest-end model sports a full-size screen and keyboard, active-matrix color screen, lithium-oxide battery and 75-MHz clock speed.

"It is absolutely the next step in [notebook] technology," said Morris McGuire, workstation LAN support group leader at Burroughs Wellcome Co., a pharmaceutical manufacturer in Greenville, N.C.

IBM PC Co.'s ThinkPads are the standard notebook at Burroughs, "but they're heavy and run out of battery power really fast," McGuire said.

Ultra's weight puts it in the subnotebook category. However, "there are no major compromises associated with it," said Martin Reynolds, an analyst at Computer Intelligence InfoCorp in Santa Barbara, Calif. Most subnotebooks lack full-size keyboards and screens, but the Ultra uses the same keyboard as the full-size HiNote, complete with a sculpted palm rest and left- or right-handed trackballs.

To keep the machine thin, Digital took the floppy disk and the batteries out of the box. The battery is placed on a hinge in back of the unit and flips down to tilt the notebook to what users said was a comfortable typing angle.

Planning ahead

Next year, Digital plans to add the following features to its notebooks: 10.4-in. color thin film transistor screens, integrated CD-ROM drives, Pentium CPUs, removable hard drives, Cellular Digital Packet Data, wireless LAN and WAN.

Everything for a price

One user balked at the $5,000 price on the high-end Ultra models. "They won't change the industry price-wise," agreed Jim Greene, an analyst at BIS Strategic Decisions in Norwell, Mass. But the prices are in-line with similarly featured models from AST Research, Inc., Dell Computer Corp. and IBM, he said.

The success of these notebooks is critical to Digital's overall PC strategy, according to Shyam Jha, director of product management for mobile products. "We will use these notebooks as the entree into the minds of customers," he said.

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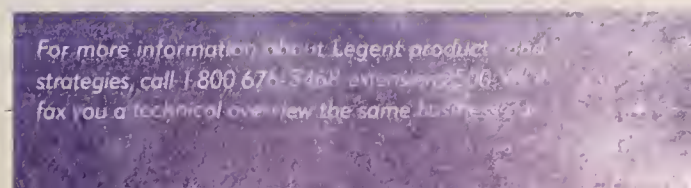
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LEGENT

Back in the 15th century, this was a generally accepted view of Hell. Today, of course, we can see how inaccurate it really is. Not one person, for instance, is shown trying to manage a corporation's distributed systems. You can probably forgive the artist for this oversight. But you may be wondering when someone will deliver the management software that can help you take care of this mess.

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CALS supporters lobby for worldwide acceptance

Protocol standardizes electronic commerce

By Joseph Maglitta
CAMBRIDGE, MASS.

A small group of powerful users and manufacturers is pushing to turn a little-known U.S. Department of Defense protocol into a worldwide standard for electronic commerce.

IBM, Electronic Data Systems Corp., Westinghouse Electric Corp., Northrop Grummon Corp. and governments are among those working to help Computer-Aided Acquisition and Logistics (CALS) shed its flagging, military image. These and other CALS backers said at a recent conference here that the standard has the right stuff to help companies conduct business electronically.

Described as "the manufacturing lane on the information superhighway," CALS standardizes how product-related and manufacturing process data is exchanged electronically.

Despite this backing, however, CALS faces an uphill battle. Aside from United Air Lines' new $40 million maintenance system, relatively few nondefense firms have adopted CALS recently. Additionally, CALS supporters have been fighting for funding and support in Congress.

"A lot more clarification is needed," said Sydney Gillibrand, vice chairman of British Aerospace Public Limited Co. and chairman of the UK's new CALS council.

Originally hatched a decade ago at the Defense Department, CALS was pushed as a way for defense contractors to replace paper with digital information. After a few lackluster years, the acronym was renamed Continuous Acquisition and Lifecycle Support.

Today, backers are pushing a new definition: "Commerce at Light Speed."

"CALS is at the crossroads," said Martin Hoffman, director of the Center for Technology Policy and Industrial Development at MIT in Cambridge, Mass. For CALS to prosper, it must take root in governments and businesses around the world, he and others said.

Change in tide

That is exactly what the CALS-ites are trying to do. Most of the recent action, though, has focused on marketing activities — with defense contractors and government agencies trying to persuade other users to adopt CALS. Groups at both the national and international levels are trying to decide whether CALS' technical underpinnings will need to change to help it fulfill an expanded role.

Currently, 14 nations, including Japan, France and Sweden, have formed CALS industry groups to promote CALS in their countries. In addition, NATO countries recently adopted CALS as a standard way of conducting international commerce, said Elaine Litman, director of CALS and electronic data interchange at the Defense Department.

And Japan is quickly getting serious about adopting CALS as a national standard, said Micio Naruto, a director at Fujitsu Ltd. Recent activities include a $4 million CALS-like pilot at Tokye Electric Power Co., two planned CALS Japanese publications and a CALS expo that drew 10,000 people.

Ultimately, CALS will provide a framework for enterprisewide integration and global electronic commerce in the next century, said James A. Abrahamson, chairman of Oracle Corp. and chair of the CALS Industry Steering Group.

New designs for CALS

CALS defines standards for how data is stored, transmitted and used throughout a company. Traditionally, it has addressed engineering and design data, but CALS backers are working to expand the types of data the standard can handle.

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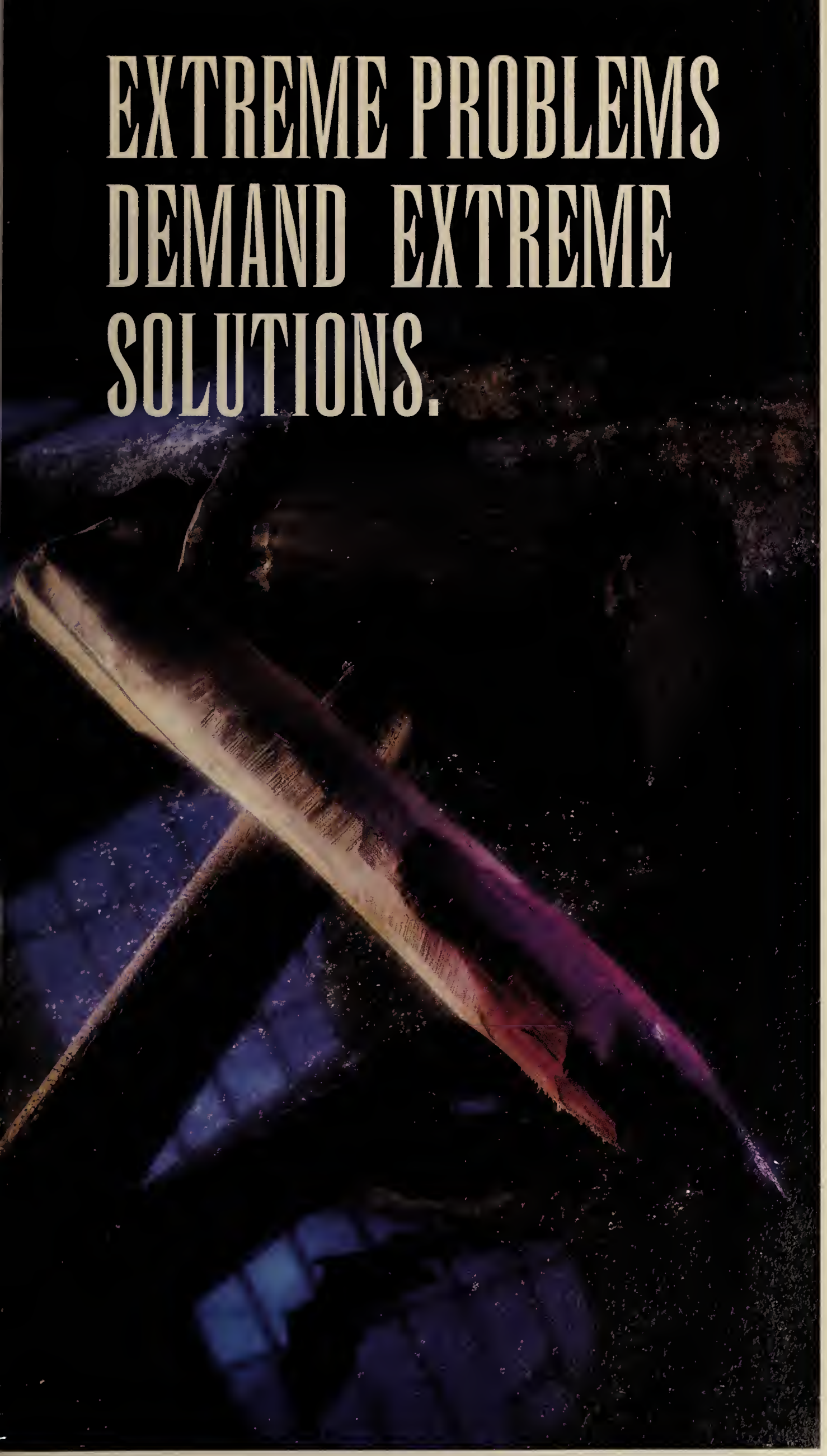
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Users cast cool eye on deal

CONTINUED FROM COVER 1

ing strong come delivery of the first systems based on the modified PowerPC Reference Platform (Prep) specification. Given that reality, users were having trouble last week viewing the alliance as a serious technological alternative.

In addition, the announcement fell short of disclosing the details of a unified standard, further tempering the already tepid enthusiasm. Les Credele, vice president and general manager of Motorola's RISC Microprocessor division, said that although "coarse-grain details have been worked out," the three parties still must further refine the specification.

Among the details yet to be polished, according to Apple product line manager Jim Gable, are how the system accommodates and recognizes firmware, certain hardware registers and the Peripheral Component Interconnect bus. With Prep now synonymous with inconsistent IBM and Apple designs, Gable said, Apple prefers the phrase "common platform."

"What most users say is this [alliance] is good for the health of the industry, but they don't have a software product that tells them that yet," says John Dunkle, president of WorkGroup Technologies. "How do you simulate the benefits of a future partnership?"

Foot-dragging on the unified standard has especially turned off IBM users. In a *Computerworld* survey, 65% of 73 Apple users thought it "very important" or "moderately important" that the three companies define a unified hardware standard, while only 17% of 69 IBM users surveyed agreed.

In fact, when asked which microprocessor would be in the majority of the PCs planned for purchase during the next year, 77% of non-Apple users cited the 486, 17% said the Pentium and none said the PowerPC. Conversely, 41% of Apple users cited the PowerPC, 39% said the 486 and 14% said the Pentium.

Particularly irksome is IBM's long-standing inability to drum up significant support from the top-tier developers for its operating systems, the latest example of which is OS/2 for the PowerPC. IBM has twice delayed delivery of that operating system, which is now not expected until June of next year.

"In my opinion, people should be very suspicious of initiatives that lack focused [independent software vendor] support, [something] IBM has never been able to garner," said Art Tisi, chief information officer at the Metropolitan Museum of Art in New York.

History lesson?

Some users also said they fear Apple will not convincingly propagate the benefits of a unified platform given that it has spent years claiming it is difficult for its independent software vendors to effectively port Macintosh applications to new platforms.

"Apple did not want to go with Prep because it would take their developers so long to rewrite their apps. I have to wonder how hard Apple will now lean on their partners to write" to the common platform, said Brian Moura, assistant city manager for the city of San Carlos, Calif.

The majority of eight users interviewed said they would like Prep to succeed if only because it would pose some element of competition for Microsoft and Intel in the quest to win the hearts, minds and wallets of corporate America (see chart page 29).

But only the hardiest breed of optimist thinks this group effort among the three multibillion-dollar companies will result in any more than a slight increase in their combined desktop market shares. Apple predicted two months ago it would increase its own market share from its current 10% to 15% over the next five years and that its licensees would add another 3%. That sort of growth would give Apple barely more than niche status.

"I have nothing against the Mac OS or OS/2, but the fact is, Windows 95 will kick the crap out of anything that is out there next year," said Bill Cornfield, president of the Windows User Support group, a consulting firm in New York.

The bright side of the deal, according to John Dunkle, president of WorkGroup Technologies, Inc., a consulting firm in Hampton, N.H., is that "IBM gains the advantage of making its PowerPC platform available through multiple sources. And if users end up not voting for OS/2, IBM would

Windows 95, PowerPC lead Comdex parade

By Computerworld staff

Following up last week's agreement on a common hardware platform, IBM, Apple Computer, Inc. and Motorola, Inc. will display what they hope is a tour de force of PowerPC-based products at Comdex/Fall '94 in Las Vegas this week.

For the anticipated 190,000 Comdex attendees, IBM is expected to present for the first time publicly an alpha version of OS/2 for PowerPC running alpha versions of OS/2 applications from several developers. Several PowerPC hardware makers are expected to demonstrate systems running a beta version of Microsoft Corp.'s Windows NT for PowerPC.

Separately, Apple is expected to introduce a 66-MHz 486DX add-in board for its PowerPC-based Power Macintosh line.

The competition will get equal time. Keynote speakers include Microsoft Chairman Bill Gates on Monday and Intel Corp. President Andy Grove on Wednesday.

Gates and company will formally roll out the second beta version of the company's next generation of Windows, Windows 95, (see related story page 187), along with a slew of beta applications written to take advantage of its 32-bit multitasking, multithreading capabilities and new user interface.

Microsoft is also expected to roll out its long-rumored electronic information service, code-named Marvel (see story page 29).

What else is in store

Other announcement highlights include the following:

- **Lotus** is expected to announce InterNotes, gateway software that lets Notes client software access the World-Wide Web, file transfer protocol and wide-area information servers on the Internet.
- **Novell** will announce that it will upgrade its InForms electronic forms software and SofSolutions document management software to support the Open Document Management interface.
- **Apple** will demonstrate FireWire, its new multimedia-oriented interface that is intended to replace SCSI interfaces; it is also expected to demo systems using the Peripheral Component Interconnect bus.
- **Digital Equipment Corp.** will announce AssetWorks for Windows NT, a product that extends Microsoft's Systems Management Server to Unix clients; and the software developer's kit for Polycenter NetView on Windows NT.
- In the absence of a microkernel that would support multiple operating systems for PowerPC, **IBM** is likely to deliver several operating systems on CD, analysts said. IBM has already said it will preload some systems, including SunSoft Inc.'s Solaris and its own AIX 4.1, in the factory.

Most of the top-tier application vendors have already made their major announcements for the year, so users can expect talk about what will not ship soon.

Lotus, for instance, will brief attendees on the merits of Windows 95 features in its applications. WordPerfect, meanwhile, will continue beating the marketing drum for its yet-to-be-shipped PerfectOffice applications suite.

IBM dogged

By Michael Fitzgerald

For most youngsters, the question "Where's Waldo?" means entertainment. For IBM's 1-year-old PowerPC initiative, "Where's Charlie?" means frustration and a reminder of a string of broken promises.

Charlie is what IBM executives called their "conversational surrogate," the most intriguing piece of the company's human interface strategy. A talking head a la television's Max Headroom character, Charlie was designed to be a shell for an operating system that would give users a familiar, voice-driven interface. But one year later, Charlie and other elements of the natural interface strategy are nowhere to be found.

Charlie was to be made possible by the floating-point capabilities of the PowerPC chip, which are superior to those of Intel Corp. processors. Floating point gives better performance for data-intensive technologies such as graphics and voice, and IBM touted it as a way to clearly differentiate PowerPC systems from the Intel world [CW, Nov. 14, 1993].

IBM even demonstrated a prototype of Charlie at Comdex/Fall '93. At the time, Charlie was a two-dimensional, mask-like face running over AIX on the PowerPC. It could say hello and other phrases and would respond to limited voice commands to do database searches or place phone calls.

ILLUSTRATIONS BY LISA BLACKSHEAR

[still] have a relationship with someone that could help it retain a sizable percentage of the desktop operating systems market."

On the Apple side of the equation, Gable acknowledged last week what users have been saying for some time: that the emergence of a unified platform is critical to Apple's efforts to license its Macintosh operating system. Without a common platform, computer vendors will be less likely to license the operating system.

Gable called the common specification "the final step in Mac OS licensing" and said Apple cannot broadly license the operating system until the specification is in place, which probably won't be until the spring of 1995.

Send in the clones

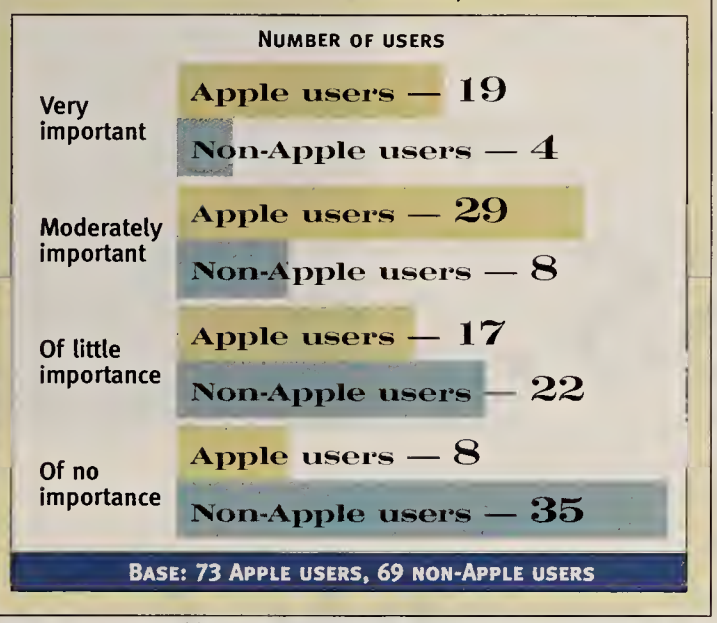
Users are interested in seeing a Macintosh or PowerPC clone market develop, but they are concerned that a proliferating Macintosh clone industry could undermine Apple's long-standing strong suit of providing Macintoshes that easily mesh with peripherals and add-in cards.

As Apple technology spreads among non-Apple hands, the chances increase that nagging incompatibilities could creep into Macintosh environments, especially among networked Macintosh clones. Users such as Brian Comnes, an information center manager and Macintosh user at DHL Airways, Inc. in Redwood City, Calif., said they wonder if they would start seeing the same types of integration headaches common in the networked Intel world, where various clones sometimes clash over interrupt requests and device drivers.

"I would worry that you might start missing quality," said Macintosh user Bob Duffy, MIS manager at Palo Alto, Calif.-based Cornish & Carey Residential Real Estate. "You get plug and play now because Apple is in control. A clone would have to truly be a clone."

Observers said that challenge is one reason why it is taking so long to develop a common specification. Phil Rueppel, a San Francisco-based analyst at Alex. Brown & Sons, Inc., said Apple will indeed find it challenging to preserve commonality among cloned systems. "There are difficulties in making sure you sort out all the potential problems in terms of where interfaces need to be designed so that plug-and-play features are maintained," Rueppel said.

How important is it to your company that there be a successful IBM/Apple PowerPC alliance as an alternative to the Microsoft/Intel standard?



Source: *Computerworld* Database Division, Framingham, Mass.

by delays; Sorry Charlie

A year later, however, IBM declined to discuss Charlie or its natural interface research.

Analysts said the natural interface was not dead, just slowed by a variety of other factors related to the PowerPC.

Other initiatives that IBM has targeted for release but that have not shipped include the following:

- IBM's Continuous Speech Series for PowerPC, a stand-alone software application.
- A command and control component that would be a layer on top of the operating system to coordinate voice commands.
- Limited intelligent agent capabilities that could, for instance, take a voice command to find a phone number, look through a database, get the number and dial it on a built-in phone.



Adding a human touch

Down the road, IBM said it would add gesture recognition, touch screens and other "human factors" elements to its PowerPC operating environment. The intelligent agent capabilities would also be expanded, though IBM officials did not give specifics.

Of course, IBM was also supposed to have released PowerPC hardware by this time. It is now shipping hardware only on a special bid basis and is not expected to ship it to the general public until late in the first quarter of 1995 (see related story this page).

IBM appears to have elements of its strategy still under development. Its Intelligent Communications division is working on agent technology, for instance. IBM last week also released new speech recognition technology, under the new name VoiceType. VoiceType will include the IBM Continuous Speech Series, now renamed VoiceType Tools. It also refreshed its OS/2 dictation program, renaming it VoiceType Dictation, and added a Windows version.

"Voice is a critical area, and they're definitely trying to move that ahead," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. "Internally, there continues to be some debate over how to differentiate and excel, focused on whether they should become a primary supplier and innovator at the component level or use other people's technology. This is not resolved yet, and Charlie may be lost in that debate."

Other elements of IBM's strategy remain unclear. The company had all but signed a deal with Totally Non-Technical, a start-up company in Evanston, Ill., that has a voice-authoring tool [CW, Aug. 1] but walked away from the altar at the last moment, according to sources near the deal.

Vendors line up on-line support

By Ellis Booker

Customers can expect to increasingly work with their vendors via on-line connections, thanks to a trend underscored by IBM's and Microsoft Corp.'s recently revealed plans to build Internet connectivity into their respective OS/2 Warp and Windows 95 operating systems.

The idea is to provide users with electronic access to technical support as well as product information, software updates and even remote diagnostics.

Of course, sending electronic mail to a tech support group or monitoring the chatter in technical forums found on commercial on-line networks such as CompuServe is nothing new. But proponents say Internet advantages include the following:

- Users can access the Internet much more quickly.
- A user system, by functioning as an IP address, could allow vendor entry, assuming there is no firewall to surmount and that the user has full Internet access. This would let vendors install on-line patches and upgrades so the user would not have to pull the patch off an on-line service.
- A common interface — such as an Internet browser — would enable users to access a multitude of vendors.



"When we go to shows and tell users, 'Here's a disk with our TCP/IP stack,' they say 'Don't give me the disk; what is your FTP address?' " said Mike Boros, Windows product manager at InterCom Corp. in Herndon, Va. "They would rather do it on-line than take a bunch of disks back with them."

That sentiment seems to be making the rounds. John Chapman, senior technical consultant at Amoco Corp. in Chicago, said IBM is already testing such a system for large corporate customers with members of the IBM Share user group, of which Amoco is a member. In the test, users send problems and diagnostics results to IBM over the Internet and receive answers and even application updates electronically.

Late this year or early next year, IBM will begin beta-testing a program that allows remote technical personnel to look into users' systems over the Internet to diagnose and, in some cases, fix an assortment of problems.

Similarly, industry observers speculate that Microsoft may use Marvel, the on-line network it plans to launch next year, as a vehicle for upgrading Windows 95.

Deborah Willingham, Microsoft's vice president of product support services, said the company has not committed to using Marvel to provide technical support, but she noted that Marvel is "a potentially important venue for electronic customer support."

Such electronic services would likely be well received. "There's a crying need for small business to have inexpensive, remote systems administration," said Angela Hey, client/server program manager at Input, Inc. in Mountain View, Calif.

But offering Internet connectivity to enable remote hardware or software diagnostics over the Internet may be based on a flawed assumption, according to Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass. "The inclusion of networking software [in the operating system] does not automatically translate to a machine connecting to a network," he said.

Chapman raised a related concern: the question of where support is managed. That is, will end users, equipped with applications and Internet browsers, dial into vendors to get patches and report errors with their software, or will this function be handled centrally?

Senior editor Stuart J. Johnston contributed to this report.

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R&D: MEASURE OF SUCCESS



CONTINUED FROM COVER 1

(see chart, opposite page).

• Facing tighter budgets, R&D chiefs are counting on technologies such as simulation tools and computer-aided software engineering to help them do more R&D with fewer dollars (see story page 36).

• The R&D figures mask a revolutionary trend toward more alliances and consortia as well as increased outsourcing of R&D (see story below).

Another conclusion that can be drawn from the study, which covered the years 1989 through 1993, and subsequent interviews is that industry players employ strikingly different models for R&D. For example, Adobe Systems, Inc. said it must invest heavily to maintain its unique products, so it consistently boosts R&D spending by almost 50% a year.

"If you look at our product line — things like PostScript, Illustrator and Acrobat — they were pretty much first of their kind," said Fred Mitchell, director of business development. "One of Adobe's mottoes is 'Invent your way forward.' "

But companies such as KnowledgeWare, Inc. and Encore Computer Corp. illustrate the folly of using R&D spending as a kind of insurance for market success. Both were highfliers in R&D during the past five years but then landed in financial disaster (see chart, opposite page).

Like any other business function, R&D needs top management support. SAS Institute, Inc. plows 34% of its $500 million in annual sales back into its software products — mostly because of the interest and philosophy of its president.

"I came up as a programmer, and I've always been immersed in R&D," said SAS President Jim Goodnight, who still spends half his time programming. "I guess when the boss is head of R&D, you tend to put more emphasis on that."

Relative to its size, SAS outspends all the companies in the study sample by a wide margin. The privately held software vendor will not reveal its profits but says that sales have climbed 150% in five years.

No guarantees

Of course, R&D alone does not make money. "Is there a proven, direct correlation between R&D intensity and financial success? The answer to that is definitely 'no,' " said Richard S. Rosenbloom, a professor of business administration at the Harvard Business School.

"You've got to have the marketing capability to focus the R&D, as well as the manufacturing and distribution capabilities," Rosenbloom said. "It's the combination of these things that produces profits, not just R&D."

But Sam Fuller, vice president of corporate research at Digital Equipment Corp., argued that the link between R&D and the bottom line cannot be dismissed.

"A couple of years ago, we looked at companies in the computer industry that were growing and at those that had stagnated," Fuller said. "There was a strong correlation between those that are prepared to make aggressive investments and those that are not. R&D does have a strong impact on sales two to three years out."

In fact, Digital is running full-page advertisements trumpeting: "You don't spend $1.3 billion on R&D if you're not planning to stick around." However, the ads do not mention that the $1.3 billion figure is 25% less than the company spent on R&D just three years ago.

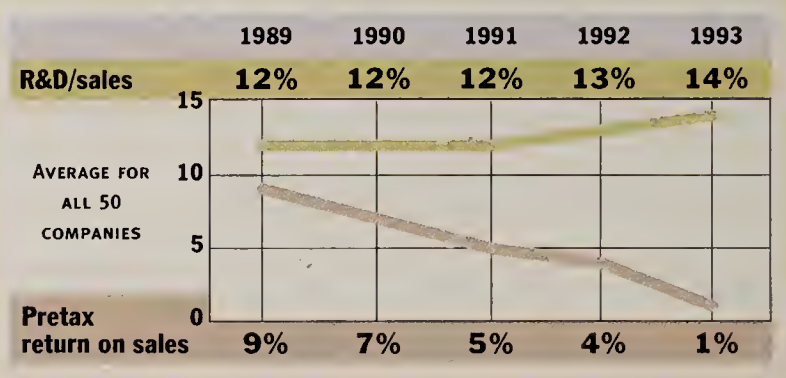
Other companies that showed a steady pattern of declining or below-average R&D spending include IBM, Wang Laboratories, Inc. and Unisys Corp. But while the lack of research spending did not cause financial decline for those vendors, financial woes from other sources led to the slashed research budgets, industry analysts said.

The old business model employed by IBM, Digital and other vertically integrated systems companies no longer works, business experts agreed. The move to open systems and increased competition has squeezed the gross margins of these companies from 50% down

R&D, *page 36*

SLIDING SCALE

Analysis by *Computerworld* shows that increases in R&D spending are likely to boost a company's sales and market share, but not necessarily profits. In our 50-company sample, R&D nosed steadily upward during a five-year period but did nothing to improve declining pretax profit margins.



Source: SAS Institute, Inc. and Standard & Poor's CompuStat, a division of McGraw-Hill, Inc.



"I CAME UP AS A PROGRAMMER, AND I'VE ALWAYS BEEN IMMERSED IN R&D. I GUESS WHEN THE BOSS IS HEAD OF R&D, YOU TEND TO PUT MORE EMPHASIS ON THAT."

– Jim Goodnight
President
SAS Institute, Inc.

ALLIANCES rising, budgets sinking

By Mitch Betts
and Gary H. Anthes

Corporate research and development units are jumping on the virtual corporation bandwagon.

Outsourcing, alliances, consortia and partnerships are all the rage in the computer industry, as some companies cut internal R&D budgets and seek to leverage the equivalent expertise of others.

"The R&D work that is necessary to the success of the company still gets done, but it may not be done within their own walls," said Jules J. Duga, senior R&D policy analyst at Battelle Memorial Institute in Columbus, Ohio.

Classic examples of alliance fever include the three-way partnership of IBM, Motorola, Inc. and Apple Computer, Inc. to make the PowerPC chip or the Austin, Texas-based industry consortium Microelectronics & Computer Technology Corp.

Squeezed profit margins and increased technological complexity make it impractical for companies to develop everything themselves. Computer company officials also said the move to open systems makes it feasible to buy standard components off someone else's shelf.

THE BIG CHALLENGE OF THE VIRTUAL R&D DEPARTMENT IS TO MANAGE THE COMPLEX RELATIONSHIPS AND ABSORB THE EXTERNAL WORK.

"This industry is in a cycle that is not providing enough gross margin for one company to do it all," said Kenneth G. Fisher, chairman and chief executive officer of Encore Computer Corp. "We used to all do our own operating systems, our own storage devices, our own chips or CPUs. Today you buy those, and you bring specific functionality to these boxes in order to differentiate your product."

Amdahl Corp. has taken the notion of outsourcing R&D further than most — in a recent reorganization, the internal R&D unit was virtually phased out. The remaining fragments were dispersed to the business units, which concentrate mostly on systems integration issues, quality testing and software development.

"Spending hundreds of millions of dollars developing new [hardware] platforms . . . is just not affordable any longer," explained Bruce Ryan, Amdahl's chief financial officer.

So, Amdahl is leaning much more heavily on Fujitsu Ltd. for mainframe systems R&D. It also has alliances with Encore for high-end disk drive technology and with NCube and Oracle Corp. for parallel processing technology.

Adobe Systems, Inc. has taken an unusual approach by setting up a $25 million venture capital fund to invest in fledgling software companies. It has made four such investments so far and expects to make eight to 10 more.

Fred Mitchell, director of business development at Adobe, said his firm hopes these start-ups will take Adobe technology into markets it could not easily penetrate itself.

Digital Equipment Corp. extends the partnership concept to certain key customers, said Sam Fuller, vice president of corporate research. For example, Digital let some users purchase prototypes of its Gigaswitch/ATM switching product.

In years past, prototypes were built just to demonstrate capability, then laboriously reengineered for volume production. But selling the switches as first-generation products got them to market two years early, Fuller said.

The big challenge of the virtual R&D department is to manage the complex relationships and absorb the external work.

"It's hard enough for a company's internal R&D laboratory to communicate with its own sales, marketing and production departments," Duga pointed out. "It's even more difficult when the R&D work is being done externally."

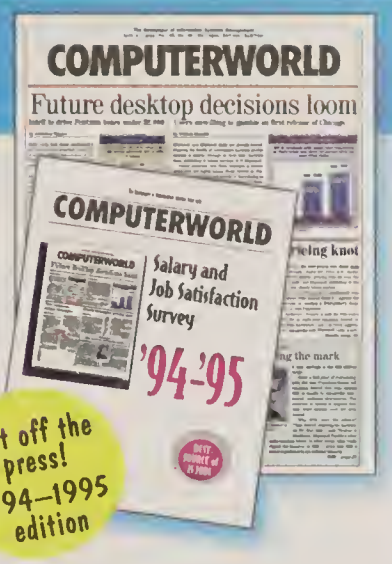
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- 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin. Services
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
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- 13. Treasurer, Controller, Financial Officer

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- 70. Medical, Legal, Accounting Management

OTHER PROFESSIONAL MANAGEMENT
- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products ❑ Yes ❑ No

Networking Products ❑ Yes ❑ No

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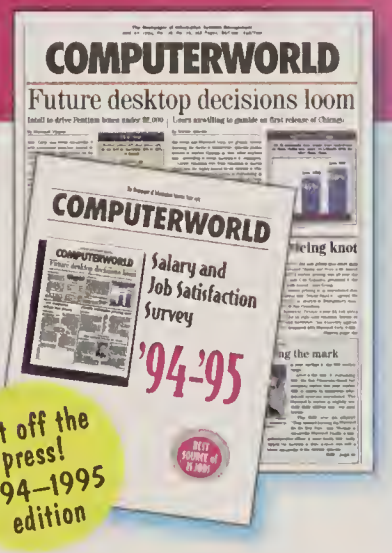
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- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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- (f) Windows NT
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Networking Products ❑ Yes ❑ No

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R&D SPENDING AND THE BOTTOM LINE

This list of 50 computer companies tracks R&D spending from 1989 through 1993 against some standard measures of financial success. At best, these R&D figures show only a loose correlation with marketplace success. In **column one**, companies are ranked from the biggest spenders to the most tight-fisted, on the basis of R&D as a percentage of sales. The **second column** shows average increases or decreases in R&D spending. The **final three columns** reveal commonly used measures of financial success for publicly held companies.

All numbers reflect a five-year average.	RESEARCH & DEVELOPMENT		MEASURES OF SUCCESS		
COMPUTER COMPANIES	R&D as % of sales	Average annual % change in R&D	Average return on equity %	Average return on sales %	Average annual % change in market value
Platinum Technology, Inc.	31.0	107.5	21.3	14.1	-21.7
Mentor Graphics Corp.	19.8	14.7	-7.8	-4.4	11.6
Symantec Corp.	19.5	75.2	9.7	4.1	96.1
Bachman Information Systems, Inc.	18.5	5.3	-15.4	-10.7	-74.5
Encore Computer Corp.	18.3	11.5	NM	-35.2	-17.2
KnowledgeWare, Inc.	17.7	59.7	10.1	5.2	-24.2
BMC Software, Inc.	17.6	38.5	29.9	22.7	35.8
Sybase, Inc.	17.2	54.3	8.3	4.5	133.0
Cray Research, Inc.	17.1	0.7	10.7	8.7	-6.9
Adobe Systems, Inc.	16.5	48.7	32.5	21.7	36.7
Stratus Computer, Inc.	16.4	18.2	13.9	9.1	25.3
Lotus Development Corp.	16.4	16.3	15.0	7.1	42.9
Amdahl Corp.	15.8	5.4	-9.7	-3.8	-14.3
Tandem Computers, Inc.	14.9	13.5	-10.1	-2.5	-7.0
Chipcom Corp.	14.8	56.4	15.3	8.2	53.5
Convex Computer Corp.	14.5	13.2	-6.5	-3.9	-15.2
Borland International, Inc.	14.4	60.0	-15.8	-5.8	70.8
Aldus Corp.	14.1	33.9	13.5	11.6	43.6
Autodesk, Inc.	14.1	29.0	22.8	19.4	12.6
Silicon Graphics, Inc.	13.4	51.4	3.3	2.5	84.8
Microsoft Corp.	13.0	44.3	31.3	24.2	81.7
Banyan Systems, Inc.	12.8	13.0	13.9	6.8	-24.8
Legent Corp.	12.8	63.1	16.3	15.0	31.7
Informix Corp.	12.5	46.3	6.7	5.6	165.4
Computer Associates Intl., Inc.	12.4	6.7	20.5	13.4	26.0
Pyramid Technology Corp.	12.4	18.4	-2.9	-0.9	43.3
Intel Corp.	12.3	27.9	20.4	18.1	43.8
Sequent Computer Systems, Inc.	12.3	24.8	-1.0	-0.6	12.4
Intergraph Corp.	12.1	15.2	2.4	2.1	-10.9
SynOptics Communications, Inc.	11.9	75.4	21.1	12.1	113
Digital Equipment Corp.	11.9	0.4	-9.2	-2.8	-12.1
Sun Microsystems, Inc.	11.2	17.7	11.6	4.5	29.7
Boole & Babbage, Inc.	11.2	17.9	2.8	2.7	26.9
Oracle Corp.	10.9	26.0	21.2	7.9	73.4
Data General Corp.	10.5	-11.6	-14.0	-5.0	44.7
3Com Corp.	10.4	15.9	0.2	0.3	59.3
Cabletron Systems, Inc.	10.2	42.4	28.9	20.2	104.1
Hewlett-Packard Co.	9.8	8.5	12.6	5.8	24.7
Motorola, Inc.	9.2	18.3	12.4	4.8	40.4
Novell, Inc .	8.9	39.9	19.0	15.9	102.0
Apple Computer, Inc.	8.5	12.4	21.9	6.1	-5.8
Wang Laboratories, Inc.	8.5	-23.1	NM	-17.8	-36.2
IBM	7.6	-3.7	-8.6	-1.9	-7.8
Texas Instruments, Inc.	7.3	4.8	4.5	1.4	22.4
Cisco Systems, Inc.	7.2	117.9	36.1	22.0	171.5
Unisys Corp.	7.2	-9.7	-14.3	-3.7	39.8
Sterling Software, Inc.	6.9	61.2	3.5	2.6	91.9
Compaq Computer Corp.	4.1	8.0	17.5	8.0	34.1
AST Research, Inc.	3.1	18.1	7.2	3.6	76.5
Dell Computer Corp.	1.9	27.2	13.8	3.2	137.6
COMPANY AVERAGE	12.5	29.6	9.1	5.2	43.0

NM = Not meaningful More than doubled the average 43% market value increase of the 50 companies.

Source: SAS Institute, Inc. and Standard & Poor's CompuStat, a division of McGraw-Hill, Inc.

LINKS between R&D, success remain elusive

By Gary H. Anthes

Measuring the payoff from information systems expenditures is the Holy Grail for the IS manager. The manager of research and development faces the same fundamental question: "What impact will my activities have on the corporate bottom line?"

The answer is: "It depends."

A *COMPUTERWORLD* SURVEY FOUND THAT HEAVY SPENDING ON R&D IS NO GUARANTEE OF CORPORATE SUCCESS.

Assisted by extensive statistical analyses by SAS Institute, Inc., *Computerworld* found that heavy spending on R&D is no guarantee of overall corporate success.

Companies such as Adobe Systems, Inc. and BMC Software, Inc. were industry leaders in R&D during the five-year period analyzed. These and other companies spent a relatively high percentage of their sales on R&D while sharply boosting research outlays year to year. They also posted stunning financial results (see chart at left).

Meanwhile, companies such as KnowledgeWare, Inc., Encore Computer Corp. and Amdahl Corp. were also big spenders in the laboratory — but they stumbled badly.

There is a high correlation between a company's spending on R&D and its sales, operating income and market value, according to regression models set up by SAS. But that is not much help to a company president agonizing over his R&D budget, because that correlation says only that big companies tend to have large R&D budgets while smaller ones spend comparably less on R&D.

Computerworld and SAS also did time-series analyses that looked at how changes in R&D expenditures in a given year might influence various measures of financial success in subsequent years. Most of these models showed weak correlations between R&D spending and later financial results. A fairly good connection was found, however, between changes in R&D outlays in a given year and changes in the market value of the company two years later.

For example, companies such as Silicon Graphics, Inc., Microsoft Corp. and Sybase, Inc. have consistently boosted R&D spending by 40% to 50% a year while enjoying 80% to more than 100% increases in the market values of their companies.

CONSISTENCY counts

While some managers agonize over their R&D budgets, at SGI it is a snap.

"We have a business model we've been religious about for several years," said Forest Baskett, senior vice president of R&D and chief technology officer. "We spend 11% to 13% of our gross revenue on R&D." That is the level of spending SGI feels is needed to meet its target of 10% to 12% operating profit, he explained.



SGI's Forest Baskett: *Steady R&D funding is built into the business model*

In fact, many companies in the computer industry seem to peg their R&D spending to a certain percentage of sales revenue — come hell or high water.

During the five-year period in *Computerworld*'s study of 50 prominent hardware, software and networking companies, the steadiest R&D spenders were Apple, whose R&D-per-sales figure has stuck close to 9%, and IBM, which has stayed close to 8%. Digital remained at roughly 12% even when its profits took a nosedive during the past few years. Other companies whose R&D intensity strayed only a percentage point or two include Hewlett-Packard Co. (10%), Lotus Development Corp. (16%), Microsoft (13%), Oracle Corp. (11%), Sybase (18%) and Unisys Corp. (7%).

One advantage is that the R&D chief does not have to develop and defend a budget request each year. "We can look at our revenue projections and pretty much write down what our R&D budgets are going to be," Baskett said.

There are 7 crucial services your next network should perform.

(But try telling that to IBM and Microsoft)

Now that you're about to spend time and money on a next generation network, the last thing you want is a product that's not all there. Unfortunately, that's exactly what our competitors are trying to sell you. Because while your next network will need to perform way beyond file and print, those basics are all IBM and Microsoft can deliver today. And the truth is, even those aren't up to NetWare standards.

NETWORK USERS. THE VOTE IS IN.

*IDC Jan-June 1994 Server Network Operating Systems Node Shipments**
Novell: 72% / Banyan: 7% / Microsoft: 7% / IBM: 7% / DEC: 3% / Other: 4%





PROMISES ARE NICE BUT THEY CAN'T RUN A NEXT GENERATION NETWORK.

So what do the other guys deliver? Little more than a promise to provide you a full service network operating system somewhere down the road (the high-tech version of "the check is in the mail"). Or maybe they can point you to a third party vendor. But that's not enough to run the network you need today.

You see, while IBM and Microsoft are just beginning to offer basic file and print services, networking requirements have been cruising ahead. In fact, networking with 32-bit NetWare 4 today encompasses more than just local workgroups and file and print, it's evolved to create a distributed network that speeds timely information directly to the people who need it. At the moment they need it most. That kind of feat demands a proven product, not just a promise. And right now Novell's NetWare 4 is the only one that can deliver.

WHY YOU NEED WHAT WE'VE GOT: THE MAGNIFICENT 7 EXPLAINED.

Networking today means being able to hook up with people and information anytime, anywhere with a single login. It means salespeople on portable computers can let the home office know what's up with sales in Dubuque. In minutes instead of weeks. It means a key player on the road can keep collaborating with folks at home to get that business plan in the banker's hand tomorrow.

Working like this requires seven



crucial services from your network. One must is a directory service. No more looking for data in all the wrong places. Simply log in to the network once to get the info you need the moment you need it.

Built-in messaging lets you use most of the popular groupware packages such as E-mail, calendaring and others. Better yet, because it uses the same directory as the network operating system, you're blessed with a single-point-of-administration that saves time and money.

Multiprotocol routing with NetWare gives you software-based routing (no new hassles, no new hardware) for connecting your network with the rest of the world. That way, not only do you get the info you need anytime, anywhere, but you can collaborate with anyone, anywhere.

Network management with NetWare 4 lets you manage your entire network from a single-point-of-administration. And to make things even easier, our graphical MS Window's management utilities reduce repetitive, multistep tasks to a simple click of a mouse.

Security with NetWare 4 allows administrators to control access to sensitive information within a distributed environment. In fact, it was designed to meet the National Computer Security Center's Class C2 Network Security criteria. Your information can't get much safer than that.

And last but certainly not least, file and print—the services that started it all. Only NetWare 4 offers data migration, suballocation and compression so you won't have to buy extra hardware like the other vendors require. Simply put, our file and print services beat IBM and Microsoft cold on both performance and cost.

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It's true. In fact, no other migration path is this easy and risk-free. On top of having the same basic architecture we've always had, NetWare 4 also features built-in migration tools so you can upgrade now. Backward compatibility to NetWare 3 means that applications written for NetWare 3 run on NetWare 4. And because you can manage NetWare 3 from a NetWare 4 server you can transition at your own pace. Installation is more hassle-free thanks to NetWare 4's simple install option. Even administration is a breeze because NetWare 4 lets you make all those routine, repetitive tasks in one intuitive step.

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Services	Novell NetWare 4	Microsoft NT 3.5	IBM LAN Server 4.0
1 Directory	Yes.	No	No
2 Integrated Messaging	Yes.	No	No
3 Multiprotocol Routing	Yes.	No	No
4 Network Management	Yes.	Limited	Limited
5 Security	Yes.	Limited	Limited
6 File	Yes.	Yes.	Yes.
7 Print	Yes.	Yes.	Yes.



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R&D: MEASURE OF SUCCESS



CONTINUED FROM PAGE 32

to between 30% and 40%. That makes it impossible for companies to continue spending 10% on R&D, 30% on sales and marketing and 5% on overhead, experts concluded.

Financially troubled Encore learned that painful lesson and is reshaping itself accordingly. Encore spent way above the industry average on R&D between 1989 and 1993 as it worked to become a "technology provider," said Kenneth G. Fisher, chairman and chief executive officer.

Fisher said systems companies must decide to become either a technology supplier or a marketing and service provider; they cannot be both. "I see us leveraging our technology through multiple distribution channels," he said.

One such channel is Amdahl Corp. In March, the two companies signed an agreement by which Encore will supply Amdahl with disk drives worth an expected $200 million a year. Selling to a few big customers such as Amdahl will allow Encore to trim its sales and support expenses while maintaining a high level of R&D, Fisher said.

As a result, Encore will be profitable next year — for the first time in seven years, Fisher said.

Another example of the old business model no longer working is Wang, which completely transformed itself from a minicomputer company into a software and services firm. Its spending on software development climbed from 15% to 80% of R&D spending, said Donald P. Casey, president of Wang.

"The key to survival," Casey said, "is finding what you are good at and then focusing on it."

Productivity is key

Still, the greatest R&D in the world will not help the bottom line if it is injected into an inefficient, unproductive corporate bureaucracy. But even modest R&D spending can produce profitable growth in the hands of a highly productive organization, said Graham K. Morbey, associate professor of management at the University of Massachusetts at Amherst.

"If you've got the two together — relatively high R&D spending plus an extremely productive company — then you do see good, profitable growth," Morbey said.

For example, Apple and Compaq Computer Corp. get good mileage out of their R&D investments because they have productive environments — as measured by sales per employee averaging $439,000 and $412,000, respectively, Morbey said. Conversely, he noted that IBM, Digital and Data General Corp. have relatively unproductive environments, judging by their lower sales/employee ratios and low sales growth.

SGI, financially successful and a relatively big R&D spender, averaged $225,000 in sales per employee from 1989 through 1993 — a figure one-third higher than the weighted industry average of $168,000.

"We are a fairly lean organization," said Forest Baskett, senior vice president of R&D and chief technology officer at SGI.

During the same five-year period, Digital pulled in only $119,000 a year for each employee, although that figure grew to $173,000 for the fiscal year that ended in July. Fuller said Digital's decision to scrap its sluggish matrix management structure made the company more efficient in R&D and elsewhere.

No room for prima donnas

Because of its many acquisitions, Computer Associates International, Inc., has gotten a close look at many software development shops and found that a lack of integration and discipline can sidetrack the best R&D efforts.

"Cullinet had some excellent technology, but they had all these factions, each with a different idea of what had to be done," said Russ Artzt, CA's executive vice president for R&D. "ASK didn't have the discipline, either. They had so many prima donnas — they just developed what they felt like developing."

Some companies simply have a better culture for exploiting R&D, experts said. It is crucial to have tight links between the R&D, marketing and strategic planning units of a business so the top R&D executive is part of the corporate decision-making team, said Jules J. Duga, senior R&D policy analyst at Battelle Memorial Institute in Columbus, Ohio.

"If the research arm is not integrated into the overall corporate planning arm," Duga said, "then that's a recipe for disaster."

Another disaster brewing is the computer industry's fundamental shift toward R&D that favors short-term payoffs — a trend that has some long-term thinkers worried. More product-oriented applied research means less of the basic research that can produce big breakthroughs.

"That is a disturbing development because much of today's computer industry grew out of basic R&D done 15 or more years ago," said Rosenbloom at Harvard Business School. "It's not clear where the fundamental [R&D] work for the 21st century is going to come from now that the industrial firms are cutting back [on long-term research].

"The effects won't be seen for five years at least," Rosenbloom added. "But I think we should be worrying about it now."

Technical editor Charles Babcock contributed to this report.

RAW R&D SPENDING POWER

TOP 10	1993 R&D SPENDING
IBM	$4.4B
Hewlett-Packard	$1.8B
Digital	$1.5B
Motorola	$1.5B
Intel	$970M
Apple	$665M
Texas Instruments	$590M
Unisys	$515M
Microsoft	$470M
Sun Microsystems	$445M
50-company average	$347M

Source: SAS Institute, Inc. and Standard & Poor's CompuStat, a division of McGraw-Hill, Inc.



"THE KEY TO SURVIVAL IS FINDING WHAT YOU ARE GOOD AT AND THEN FOCUSING ON IT."

– Donald P. Casey
President
Wang Laboratories, Inc.

DOING MORE with less

By Gary H. Anthes

While the industry's spending on research and development has risen only modestly in recent years, R&D practitioners say new technology is giving them a lot more bang for the buck.

Data General Corp. officials, for instance, found that higher levels of integration in electronics today allow hardware companies to buy circuit boards containing many standard chips — and even entire subsystems. This replaces the need to design every circuit from the ground up.

As a result, R&D staffs are free to focus on areas where they have the most leverage and where the company will see the biggest payoff, said Bob Van Steenberg, development vice president for DG's Aviion systems. "The key is knowing who is really good at what."

New simulation tools also speed development by allowing companies to evaluate and debug prototypes in software before any metal is bent. Van Steenberg said this has helped DG shrink product development cycles by two-thirds during the past three years. The company has three major designs under way concurrently, while previously it did them one at a time, he added.

"For the same $50,000 that you used to equip someone with a lab bench and an oscilloscope, you can now equip them with something damn near a supercomputer," said Michael Murphy, editor of "The California Technology Stock Letter" in Half Moon Bay, Calif. "There's no one drawing lines on acetate anymore."

On the plus side

While automated design aids in the software arena lack the leverage of those speeding development for the hardware companies, gains in computer-aided software engineering and object technology are helping, a number of companies said.

Computer Associates International, Inc. said its CA90S, an environment-independent unifying architecture for its line of 300 dissimilar products, lets developers share software among products. "It really saves on the number of developers you need," said Russ Artzt, executive vice president of R&D at CA. "You don't have them reinventing the wheel."

Mark Theel, vice president of laboratories at Sterling Software, Inc.'s Application Management Division, said one person can run an automated stress test on new software that used to require 20 to 50 people working at terminals.

Not always easy

Not everyone claims to have found a silver bullet, however. Jim Goodnight, president of SAS Institute, Inc., said, "It seems like every release is a struggle to get out the door. In fact, it used to be easier because the software was smaller." SAS releases contain more than 6 million lines of code.

"We do have new tools that are much more powerful," said Forest Baskett, senior vice president of R&D and chief technology officer at Silicon Graphics, Inc. "But that just means we can set higher goals for ourselves and break the tools with bigger designs and harder projects."

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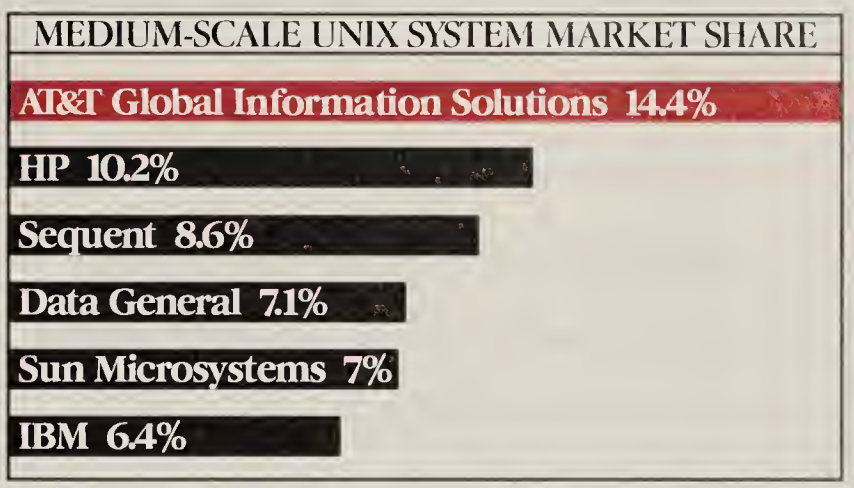
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[2] "UNIX Leapfrogs in Commercial Availability" ©1994 D.H. Brown Associates, Inc.
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COMPUTERWORLD

PC software takes next step

Downside to suites refuels interest in best-of-breed applications

By William Brandel and Ed Scannell

After paying a single-product price for application suites and reaping the rewards of one-stop shopping, information systems managers are deciding they want the option once again of buying best-of-breed applications.

In short, users want to have their cake cheap but leading-edge software and eat it, too. And margin-pressured PC software vendors are scrambling to serve it up with new packaging and licensing deals.

Since their advent more than two years ago, application suites, discounted bundles of applications, have sold quite well in fact: sales have more than doubled over the past year, according to International Data Corp., a market research firm in Framingham, Mass. Some industry research figures cite more than $1 billion in suite sales during 1993. As the market matures, however, the IS community is beginning to see a downside to suite offerings from vendors such as Microsoft Corp., Lotus Development Corp.

Suites, *page 15*

Sour on suites

Out of 400 IS managers surveyed, 55% did not think highly of suites, for the following reasons:

- If we do not use an application, it is a waste: 36%
- We do not like being locked into one vendor: 19%
- There is always an undesirable product in the suite: 10%

Source: International Data Corp., Framingham, Mass.

Industry turning to components

By Ed Scannell and William Brandel

Bulging PC applications and shrinking profit margins are forcing major software developers to hasten delivery of componentized applications, which promise to cut development costs and speed delivery of cheaper, more innovative products.

As emerging object technology crosses paths with corporate users' impatience over methods for upgrading applications (see story at left), this new building-block approach will empower information systems shops to create their own applications with vendor-supplied components. "Our primary goal is to move out applications

Suites, *page 14*

Cross Vendor supplied components are expected to spur development of a new genre of networked licensing products

Proven hand to guide Novell

By Elisabeth Horwitt

Novell, Inc. last week confirmed it is handing over its reins to Hewlett-Packard Co. executive Robert J. Frankenberg, who is said to be an experienced fighter, innovator and strategist.

Industry observers agreed those are precisely the qualities needed to successfully meld Novell's highly diversified and fragmented product lines into a winning strategy to battle what one information systems executive called "the operating system wars of 1995."

Frankenberg will take over immediately from 70-year-old President and Chief Executive Officer Ray Noorda, who said he will lend a hand "only when asked."

At the same time, Noorda announced that the Office of the President, which directed Novell's day-to-day operations during the past few

Novell, *page 10*

Robert J. Frankenberg *quickly turned HP into a PC Player*

Open Systems

Oil pilot strikes savings

By Jean S. Bozman

The oil industry took a giant step last week toward leveraging open systems to cut information technology costs.

Now at the end of its three-month-long, $500,000 industry pilot project, the Petrotechnical Open Software Corp. will ask 150 software vendors to port their applications to a common data model set of standards. At the same time, a second POSC test will start in Europe.

Seven of the world's largest oil firms — such as BP Exploration, Arco Oil & Gas Co., Mobil Oil Corp. and Shell Oil Co. U.S. — backed the pilot. Based in Houston, the pilot was intended to test the theory that the industry could create a single model for a data repository that any firm could use to share exploration and drilling data on joint projects.

Glenn Breed, a POSC cofounder and former BP Exploration executive, said the industry could cut information technology costs related to exploration by 30% to 50% in three years by using open systems and standards.

Oil, *page 16*

Making the strategic choice

Overblown promises, slow delivery, endless repositioning. These are facts of life in the operating-systems market. Our Guide to Unix vs. NT vs. OS/2 cuts through the hype with an analysis backed by a 400-user Buyer's Satisfaction Scorecard survey and a Firing Line review of Solaris 2.3.

See the Guide, Page 93

NT

SCALABILITY
INTEROPERABILITY

(Based on interviews with 50 users. Scale is 1-10, where 10 is best.)

Newspaper

Tax Systems Modernization Project

IRS turns to imaging to improve performance

By Gary H. Anthes
WASHINGTON

The Internal Revenue Service in mid-April is a bit like a snake swallowing a pig. Five thousand tons of paper will flow into IRS processing centers this week, and all of it must be hand-sorted, batched, numbered and keyed before any computer processing can begin.

However, the IRS is counting on recent advances in technology to eliminate the paper chase and with it, the bottleneck that slows the receipt of your tax refund. By whittling away at the labor-intensive, error-prone paper-handling and data-entry activities, the agency says it can deliver the performance improvements the public demands.

During the next several years, the agency will roll out imaging and automated character recognition on a grand scale. Fundamentally, it hopes to substitute electrons for 2.5 billion pieces of paper annually while knocking at least a week off the time taxpayers have to wait for their checks.

IRS, *page 26*

Taxing Times *for Treasury IS*

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COMPUTERWORLD

Briefs

DG sues IBM

Data General Corp. is suing **IBM**, claiming seven patent infringements involving CPU and memory technology. The suit seeks damages against several IBM products, including the AS/400 and System 390 mainframes. The technology in question was the result of the Fountainhead project, a 1970 DG effort to develop a 32-bit minicomputer that could provide mainframe capabilities.

ITAA looks at Intuit

The **Information Technology Association of America** in Arlington, Va., is forming a committee to investigate concerns about **Microsoft Corp.**'s proposed acquisition of **Intuit, Inc.** and to solicit views on public policy implications.

Solbourne revamps

Walter Pounds will replace Carl Herrman as president and chief executive officer at **Solbourne Computer, Inc.** in Longmont, Colo., as the final part of the Oracle Corp. reseller's restructuring.

SHORT TAKES Based on reports that **Microsoft** will offer a peek at its Marvel online service at Comdex/Fall '94, shares of America Online, Inc. and H&R Block, Inc. fell sharply, by 9.3% and 2.9%, respectively.... Ron Edgerton has resigned as chief financial officer at **Cyrix Corp.** in Richardson, Texas. No replacement has been named.... Information technology merger and acquisition firms, **Broadview Associates** in Fort Lee, N.J., and **Emerald Partners, Inc.** in Menlo Park, Calif., are merging under the Broadview name.... Client/server software vendor **IMRS Co.** has agreed to buy **Pillar Corp.**, a budgeting software developer in Foster City, Calif., for $21.7 million.... **Seagate Technology, Inc.** will buy **Applied Magnetics Corp.**'s tape-head subsidiary in Santa Maria, Calif., for $21.5 million.

Disaster recovery

Comdisco one-steps back on track

By Thomas Hoffman

Since its inception in 1980, Comdisco, Inc.'s Disaster Recovery Services (CDRS) division has led the way in providing data-center-oriented disaster recovery services worldwide.

But the hot-site industry has changed dramatically in the past two years, with corporate accounts shifting major portions of their mainframe-based processing to client/server-based environments.

CDRS, which was unable to react quickly to these changing dynamics, was also broadsided by the emergence of IBM's Business Recovery Services (BRS) unit. A division of Integrated Systems Solutions Corp., IBM's BRS entered the market in 1992 and began providing sorely needed midrange and distributed disaster recovery services.

But after an 18-month restructuring effort implemented by its parent, CDRS appears to be back on track. Last week the division reported record revenue and earnings for the fourth quarter as well as for the fiscal year ended Sept. 30.



CDRS' David Nolan: *"It became apparent that our mission statement was flawed"*

Disaster on the rise

Worldwide spending for disaster recovery is expected to increase 40% during the next two years to $1.4 billion, according to Dataquest, Inc., a market research firm in San Jose, Calif.

CDRS' revenue for the fourth quarter was $64 million vs. $55 million for the same period in 1993. For fiscal 1994, total revenue was $242 million, compared with $216 million for fiscal 1993. Pretax earnings for the year were $18 million, reflecting a 44.5% year-to-year increase, which has not been lost on Wall Street.

"We've witnessed fairly noticeable growth in pretax profitability and efficiency [by CDRS] since the restructuring," said Mark C. Jordan, a financial analyst at A. G. Edwards & Sons in St. Louis. He predicts CDRS' pretax earnings will grow an additional 22% in 1995 to $23 million.

To stay on track, CDRS this year has reinvested more than $35 million in capital equipment, including a new client/server hot site in East Rutherford, N.J., and a set of equipment upgrades.

CDRS' client/server supersite in New Jersey, which opened last month, is equipped with 500 workstations, 300 of which are prestaged for emergency response.

Next year, CDRS said it will commit another $35 million to establish a client/server supersite in the Chicago area as well as 20 regional hot sites in Montreal, Los Angeles and other locations.

"We at Comdisco needed to make structural changes to accommodate our clients' needs," said David Nolan, senior vice president of marketing and product management at CDRS.

Winning users over

CDRS' recent investments have helped it regain some of its former customers and add new ones. For example, Options Clearing Corp., the Chicago-based clearinghouse for financial transactions, signed on with CDRS last January for data center recovery services in an effort to reduce its operating costs and improve its self-contained backup capabilities.

Ralph Pfaff, executive vice president and corporate information officer at the clearinghouse, said his organization expects to reduce operating costs by 25% over the length of its five-year services agreement with CDRS.

Stac buys into remote access with Ocean Isle

By Michael Fitzgerald

■ **Stac Electronics, Inc., flush with cash after winning a patent infringement case against Goliath Microsoft Corp., is spending $20 million to buy Ocean Isle, Inc., a maker of remote control software.**

Although Stac's Stacker product dominates the disk compression market, the company is seeking to branch out. Buying Vero Beach, Fla.-based Ocean Isle and its ReachOut software is a strategic move that will help San Diego-based Stac reposition itself as a storage and communications company.

Making market waves

"Stac is moving from [being just] a shrink-wrapped maker of one product to being a broad client/server [player]," said John Bromhead, vice president of marketing at Stac. He said "inefficient" storage management for systems on hard disks was driving Stac's diversification bid and that the company may make other acquisitions.

Bromhead said the company will introduce a family of products that combines data storage and communications facilities in a networked environment, but he declined to give specifics.

Networked and mobile users "need to get to their data, and ReachOut gives you access to your data," Bromhead said.

Oceans of data

STAC'S PURCHASE OF OCEAN ISLE WILL GIVE IT AN ENTREE TO THE DATA MANAGEMENT MARKET

	Ocean Isle	Stac Electronics
1993 sales	Approximately $3M	$36M
1994 sales	Approximately $10M	$31M
Employees	65	145
Technology focus	A player in the remote-access software market with highly regarded software	The leading seller of disk compression software

Source: Stac Electronics, San Diego

While on the surface the combination of disk compression software and remote access software seems like oil and water, analysts said it is not so far-fetched.

"When you have a computer at home and a computer at work, and you have the same stuff on both, it's a waste of a hard drive," said Jeffrey Henning, an analyst at Constellation International, a consultancy in Norwell, Mass. "So if they could come up with a convenient way to store and access information elsewhere, that would be an interesting storage management tool."

A starting point

Elisabeth Rainge, an analyst at International Data Corp. in Framingham, Mass., said the deal will advance ReachOut's reach through Stac's strong distribution channels.

"I think they'll take it and use it as a springboard into the general remote access market," Rainge said. Stac's retail presence and hardware relationships should aid ReachOut against Symantec Corp.'s PCAnywhere, the remote access market leader, she added.

From an internal standpoint, the merger is expected to create few ripples. Fewer than five positions are expected to be eliminated because of minimal overlap in personnel. Three of Ocean Isle's five founders will stay on, but President Jim Kendall will not.

Editorial

IBM + Apple = Zzzz

Last week's agreement by Apple and IBM to produce a common desktop computer by the end of next year is a crashing disappointment for the industry and a major setback for customers.

Apple should license the Macintosh operating system as quickly as possible to as many vendors as possible, beginning with IBM.

Consider last week's announcement in these terms (with apologies to Rich Tennant, who conceived of this week's cartoon on his own): In a bold show of conciliation between two bitter rivals, Fiat SPA, maker of Ferraris, and General Motors agreed to produce a car with the same chassis and body design. However, the proud automakers also agreed that each will still put its own engine in the sleek machine. As a result, people who buy the car from Fiat will pay more and get a Ferrari. People who buy the car from GM will pay less and get a Fiero. Do you think the competitive dynamics of the market would be any different?



The handshake between the two onetime PC standard-setters blindly ignores the new reality of the computer industry: Hardware doesn't count. Computers have become so inexpensive that no company can shake up the world with a faster box anymore. If that were possible, Digital would be raking it in today. Software is what counts, as Bill Gates shrewdly figured out years ago.

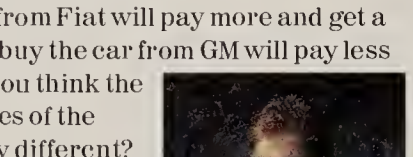
But this agreement is a hardware-first strategy. Two vendors that can't sever their manufacturing roots agreed to do something that no one cares about. And it'll take them a year to do it.

What a shame. For reasons known only to CEO Michael Spindler and God, Apple has resisted following through on its announced plans to license the Macintosh operating system to other suppliers. How long will the fear of lost hardware sales prevent Apple from taking the one step that could make it a dominant industry player once again?

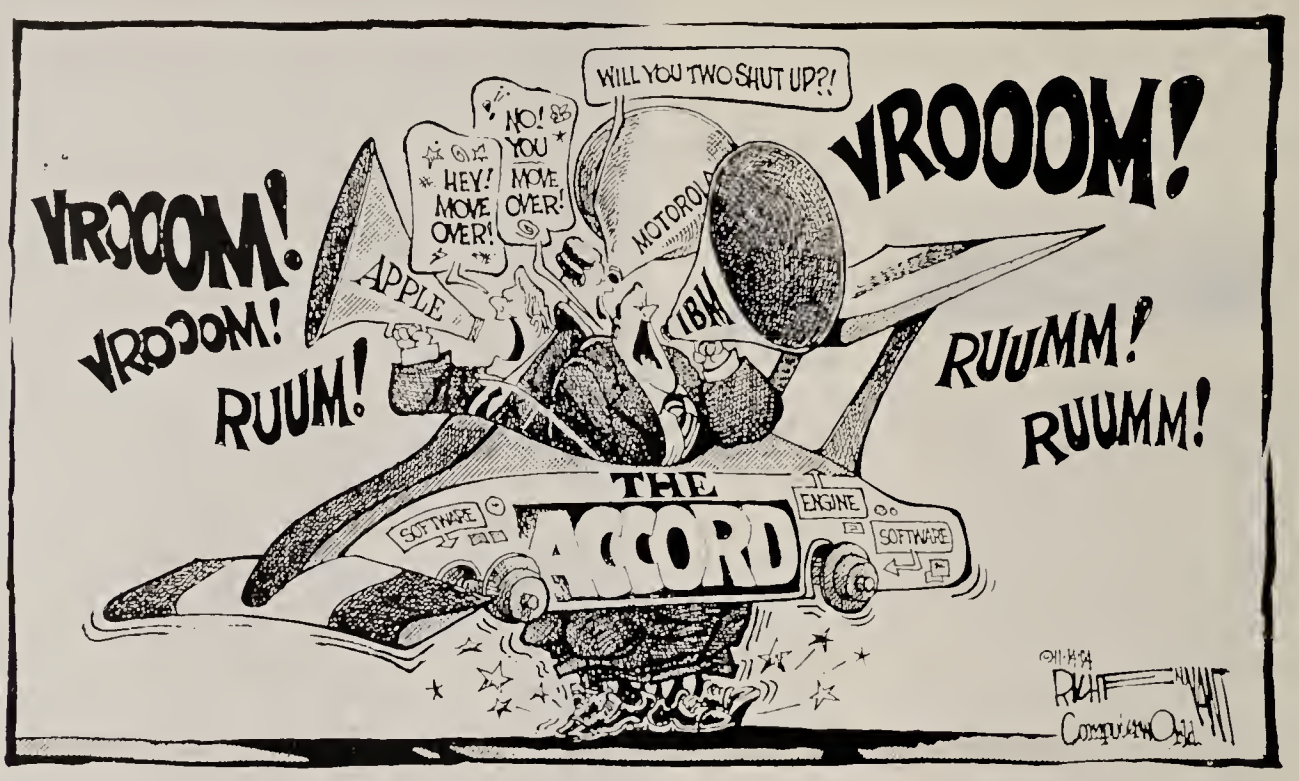
IBM, meanwhile, is committed to ramming any potential desktop software strategy into its System Object Model and Workplace frameworks, technically elegant architectures that the market has so far chosen to ignore. It didn't help that IBM recently boasted about committing $500 million to selling OS/2 Warp. It doesn't want to do anything to detract attention from that expensive effort.

But oh, the possibilities. An open, competitive market would have to cause any serious PC buyer to stop for a second look at the Macintosh platform. IBM could regain its No. 1 rank in the PC business with a Macintosh look-alike. Apple's lost hardware sales would be more than offset in the long run by profits from Macintosh operating system licenses. An operating system deal would change the whole dynamic of the desktop market. It would be Bill Gates' worst nightmare.

Instead, I think Mr. Gates is sleeping quite well these days.



Paul Gillin, *Editor*
Internet: *pgillin@cw.com*



Letters to the editor

ObjectPool not a SOM competitor

We would like to correct the implication that Sapiens is competing with IBM on its System Object Model implementation ["Sapiens bests IBM with its ObjectPool SOM tool," CW, Oct. 24]. In fact, Sapiens and IBM have cooperated closely on the development of the SOM interface to Sapiens' ObjectPool.

Additionally, you indicate that IBM's SOMobjects for MVS competes with ObjectPool. We expect users of ObjectPool to use SOMobjects to build object-oriented applications that will use the specialized objects in the ObjectPool framework. ObjectPool will normally require SOMobjects and certainly never compete with it.

Peter Barber
Senior vice president
Sapiens USA, Inc.
New York

Medical databases already work

I must take issue with "Data debased" [CW, Oct. 10]. You seem to think the public will suffer if consumers don't have access to government data on doctors and organized medicine fights the release of that data. Nothing could be further from the truth.

The National Practitioner Data Bank lists every malpractice suit *filed* against a doctor in this country. It lists only actions, not the results of those actions, hence the American Medical Association's effort to limit access to this information.

Every hospital must by law query the data bank when a doctor requests privileges at that institution; if a doctor cannot use a hospital for his patients, then he effectively cannot practice medicine. With this in mind, I believe there are adequate safeguards for the public in the present system.

I am not a member of the AMA, but I think that in this case it represents the interests of both the medical community and the general public.

Richard M. Poniarski, M.D.
Stony Brook, N.Y.

Warped account

"Glitches in OS/2 Warp may dampen IBM's client/server future" [CW, Oct. 31] did your readers a disservice. You did not disclose that the glitch was actually in OS/2's installation program and not in the operating system itself. And the real cheap shot was the inclusion of a quote expressing wonder about "what else may have slipped by [IBM]."

IBM has released the fix to this problem: Simply delete any .BAK files from the root directory of the boot drive. IBM has also said that 99.9% of the general public will never see this problem.

Neil Zampella
Belleville, Ill.

No plan, no gain

In stating that long-term planning is a waste of time and energy ["The myth of long-term planning," CW, Oct. 17], Allan E. Alter confuses the objectives of a strategic plan with the goals of a multiphased tactical plan. He compounds the confusion with quotations from planners who believe they should develop an IS strategy from within their organizations. Strategies are not for building an IS infrastructure; they are for defining how to create persistent value in the business.

When IS participates in developing the corporate mission, its own objectives will be readily identifiable. From those objectives, IS management can define specific plans for building appropriate infrastructure in the most timely manner, using the appropriate levels of technology.

Attempting to define formal, detailed, day-to-day operational events (tactics) on a five-year basis is wasteful. But strategic planning in its intended form is exactly what corporate America needs. Doing it will bring IS into the mainstream of business planning.

John L. Young
Director,
Enterprise systems planning
The Clipper Group, Inc.
Wellesley, Mass.

BEST COMPUTER NEWSPAPER 1992, 1993
COMPUTER PRESS ASSOCIATION

■ Computerworld welcomes comments from its readers. Letters may be edited and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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The dumbest headlines of 1994

Marc Dodge

This has been a vintage year for dumb computer industry stories. Here's the best of the lot so far:

• **"Janet Reno nails Bill Gates."** In July, Janet and the Justice Department proclaimed victory over the evil forces of Bill Gates and Microsoft. Shocked, frightened citizens responded by driving up Microsoft's share value 25% during the next three months.

It took professionals in the computer industry four minutes to realize that Janet was whistling past the graveyard. We learned that it is all right to be a bully, be nasty and have a monopoly so long as customers are not harmed.

• **"Chicago will be generally available in 1994."** Did anybody really buy into this? The last true believers got a hint that something was wrong when Microsoft renamed Chicago to Windows 95. Most of us are better served by a solid, dependable Chicago than an early Chicago. Remember the fun we had installing and supporting Windows 3.0?

The name change brings up an interesting problem for Redmond. What if Windows 95 is not delivered in 1995? After giving this much thought, I concluded that Microsoft will simply take the rest of the world off the Gregorian calendar. Microsoft will make 1995 last as long as necessary to deliver the operating system.

• **"ATM conquers the world."** Two years ago, I participated in a roundtable discussion with telecom managers from a dozen big companies. Ten of the managers told of their immediate, grand plans for Asynchronous Transfer Mode (ATM). Another poor soul and I were verbally stoned to death.

We said the other managers would not implement production ATM for at least five years. We were right, but they were poor sports and did not invite us back.



The CIO realizes that the computer buying binge has turned into a support nightmare.

ATM will be a 1997 (or later) event for most companies. It's getting too much press for its immediate impact. It will be an important transmission method for data, voice and multimedia, but it has too many holes (cost, lack of standards, rewriting existing applications, etc.) to happen soon. Aggressive companies are kicking tires, but that's a long way from production. Most companies are just becoming familiar with frame relay. Major telecom changes are glacial.

• **"The cost of client/server computing? Don't ask."** It serves us right. We rolled out all those PCs, LANs and a gaggle of software to go with them. Did anybody pay attention to standards? Did anybody think about the day when we would tie all the pieces together? No, and now there is hell to pay. The CEO is in a lather over the cost of technology. The CIO realizes that the computer buying binge has turned into a support nightmare. It is hemorrhaging George Washingtons.

Everybody wants single-vendor network and systems management technology that is standards-based and will support all the multivendor garbage we bought during the past five years. Too bad most businesses won't see it this decade.

The few smart companies that controlled standards and don't have one of everything will be able to start controlling support costs in the next 12 months. This will be a repeat story in 1995.

• **All information superhighway stories.** Easily the dumbest, most overworked topic of the year. Enough said — let us hope.

Dodge is telecommunications department manager at a Fortune 100 company.

Ensuring privacy protection for all

Paul A. Strassmann

You cannot manage information systems without recognizing that much of the information workforce has a deep emotional attachment to their PCs. If you tamper with this relationship, you will be attacked with the fury of a homeowner defending his own property.

The PC allows office workers to work for their own benefit. Frequent activities include composition of resumes, correspondence to enhance one's public image, self-education to acquire new marketable skills and production of memoranda to prove arguments.



The freedom to use computers for personal use also carries accountability.

It is important to note that there was no privacy protection for on-line files such as resumes under the old regime, in which a central computer recorded every keystroke. In the PC era, protecting and preserving the privacy of computer files is one of the most painful issues any information executive must address. If you neglect it, someday it will come back to bite you or your successors with potentially enormous costs for getting your digital archives reorganized.

Personal privacy dictates the imposition of tight technical rules on how to enter, retrieve and store information. Some organizations in which security has always been a prime concern already have such rules. A physically separate erasable device or a partition of memory dedicated to an individual on a server should be the only place where an individual can store private data. Only the individual should initiate the copying of private data. A person's private memory should be password-protected and possibly encrypted, and the individual should erase all such information when leaving employment.

If you don't have such policies regarding personal use of company computer resources, people can and will assume they have what lawyers call an implied right to use the systems and the information on those systems as they see fit.

There must be a line beyond which individuals should be able to manage their allocation of computer capacity for personal use. Such freedom carries the accountability for not abusing such privileges. For example, individuals should pay out of pocket for strictly personal software — games, mailing lists and checkbook managers. With most of that software, copies are passed around among casual friends. Corporate policies must make clear that copyright infringement liability for such uses should be the individual's and not the corporation's.

In addition, while the corporation must recognize the need for the individual's privacy, the individual has to consent to the organization's security standards. One way is to require that each time the person logs on to the computer he sees text defining the conditions of his access, and continuing the log-on process signifies his agreement with those conditions.

What should you do if you don't have such policies protecting both the individual's privacy and the corporation's security? Until legal doctrine and systems management policies catch up with the reality of personal computing, the only defense you have is to just say no and help people buy their own PCs.

Strassmann is a consultant in New Canaan, Conn., and author of *The Business Value of Computers* (1990) and *The Politics of Information Management* (1994).

Only tigers will survive in the IS jungle

John P. Imlay Jr.

When I wrote my book *Jungle Rules*, it was to describe the truly timeless rules for success I'd gathered during 35 years in business. In any business, at any level of the organization, at any point in time, these were the rules that worked again and again. But one place where tigers — the practitioners of jungle rules — are an endangered species is among the ranks of IS professionals.

The tendency for IS professionals to bury themselves in their technological cocoons is the biggest threat to their survival. When we, intentionally or not, spend 80% of our work hours buried in screens and readouts, sending electronic bulletins, massaging databases, littering the world with faxes and rarely crossing the path of another living organism, we run the real danger of losing our vital ability to interact with human beings. We end up not getting the most from them or from ourselves. And the overarching principle of success in the jungle — including the technical jungle — is that people are the key.

Hiding in technological cocoons is the greatest threat to IS survival



Here are some tips for applying jungle rules in the IS world:

- Believe in fate, but stalk your goal. Fate, whatever it holds for you, is inevitable; achieving your goal is not. State it in a sentence, but reason it out first. There is a vast difference between wanting to be "the world's foremost technician" and "the world's foremost applier of technology." When you know what you want to be, let the stalking begin. You can't end up a winner in a world in which you haven't decided what you want to conquer.
- Lay out your plan, then strike like a cat. As a part owner of the Atlanta Falcons, I know that aggressive execution by a modestly talented player will bring better results than lame execution by a gifted player. Lay out your plan, then execute it with the tiger's air of unconquerability. Surround yourself with similar people, then share one another's goals.

IS managers have more opportunities to share goals than almost any other group. There are colleagues, managers, users, vendors and customers. You need to forge information partnerships with other goal sharers. And you need to ask technology vendors up front how they intend to help you achieve your goals. Don't look just at their technology, look at their people. If they are staffed with tigers willing to do whatever it takes to help you succeed, then look at them more closely. What is their long-term financial outlook? How do they measure quality? Are they a global company? Are their customers just satisfied or delighted?

- Don't be afraid to do whatever it takes. At least some part of your job is finding technology that serves people and their goals. The "whatever it takes" mentality means going to whichever source has it. Outsourcing has become a popular option, but sometimes the solutions are too generic.

"Whatever it takes" might mean what I call "insourcing" — that you as an IS manager become an entrepreneur and bid on the outsourcing contract against the professionals. You and your staff, plus outside partners in many instances, can outperform those who don't know your business. You may start a separate business or just form an internal profit center.

Insourcing in many cases will keep the strategic and competitive IS function more aligned with corporate goals. It might be tougher to implement, and perhaps even costlier, than an outsourced answer, but "whatever it takes" is the only mentality that will get you to your goals.

- The king of the jungle is the customer. There's an adage among fishermen: "You catch more fish when you keep the worms warm." That applies to how vendors should view their customers, and it applies to the way you should view your customers — the information consumers inside and outside your company. They come first, and relentlessly so. Come out of your cocoon and talk to them. Learn their goals, and share yours. Out of dialogue — in the eye and personal — comes mutual commitment.
- Save the tigers. The traits of the business tiger — energy, aggressiveness, creativity, resourcefulness, passion and empathy — define a group of people who can be unconquerable. So much importance hangs on the performance of IS managers today that to be anything but a tiger risks, at least, compromised goals. At worst, the risk is IS failure. When you've found the tigers, hang on to them. They're few and far between and utterly indispensable.

Imlay is chairman of Dun & Bradstreet Software and author of *Jungle Rules* (Dutton).

Why isn't information technology giving us more time?

Patricia B. Seybold

Time to spend with our families? Time to spend with our friends? Time to relax? Where did all that time go?

Yes, we're more productive than we were 30 years ago. We can do amazing things in short periods of time. We can design products efficiently with globally dispersed project members. We can respond to a customer's request in hours, not weeks. We can innovate. We can react. But we are paying a price and are stuck in a spiral of workaholism.

We all have PCs, workstations, handhelds and cellular phones. The average businessperson is now expected to tap into E-mail around the clock. We can churn out a lot of work anywhere, anytime. And we do. We work after the kids are in bed. We work first thing in the morning. We work on airplanes and in airport lounges.

Unfortunately, we're working too hard to be effective. All of this productivity is becoming a grind. We're missing the spontaneity that used to spice up our less frenetic lives. We carefully carve out time for our families and our passions. And then we're back, juggling meetings and returning phone calls.

We need to develop practices for sharing information even more effectively. We need to focus on saving time and energy, not squandering them on activities with diminishing returns to ourselves and our organizations.

As computer users and managers of our own time, most of us are consciously incompetent. We know what we should be doing, but we haven't really got it down. Mastery is when you are unconsciously competent at what you do. Whether you are performing brain surgery, conducting a violin concerto or playing at Wimbledon, your attention is clearly focused on the outcome, not on the process. Because you've mastered the details, you pull off all the little tricks of the trade without thinking about them.

We need to focus on saving time and energy and stop squandering them



What we're missing in the information age is mastery over how we use our information systems to do our jobs. Our tools still get in the way. Today we have to master at least two disciplines: our field of endeavor and our effective use of information technology.

We need coaching, which we already get from mentors in our professional life. Who are our mentors in mastering our information tools? We need to apprentice ourselves to masters in the discipline of organizing information and focusing our attention. We need to master the art of managing our time and master our information technology tools so they get out of our way and out of our consciousness.

Where can we find such coaches? The Productivity Development Group in Santa Barbara, Calif., is one good source of this kind of training and coaching. Or, look in your own organization for that person who makes work just disappear, the one with the clean desk and the chuckle in his or her voice. If there's someone like that at your office, chances are you're ignoring a valuable resource.

But don't just pile more on their plate. Find out what makes them tick. What are their habits? What choices do they make on a moment-to-moment basis to prioritize their workload and commitments?

Find someone, inside or outside your organization, who will coach you in the fine art of managing your time and commitments with a clear conscience. Move on to mastery!

Seybold is president of Patricia Seybold Group in Boston. Her Notes address is Patricia Seybold@PSOCG. Her Internet address is PSeybold@PSGroup.com.

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Application suites

Users take first look at PerfectOffice beta

By William Brandel

■ WordPerfect, the Novell, Inc. Applications Group, is expected to ship PerfectOffice, its new applications suite, before the end of the year. Announced last summer and originally slated to ship shortly after Labor Day, the product just recently entered its first beta-test phase.

As happens with any initial beta test, users' experiences vary widely. Three of the fewer than 100 beta testers who have run the suite through some of its paces said their perception of the product is based largely on the quality of the code they have received.

PerfectOffice will ship in three versions: PerfectOffice Standard, PerfectOffice Professional and a CD-ROM-based version called PerfectOffice Select. The beta testers have received PerfectOffice Professional. Like the standard edition, PerfectOffice Professional includes six base applications as well as the Paradox database from Borland International, Inc. and Visual Application Builder from Novell. Visual Application Builder is a relatively easy-to-use development tool that enables the user to build custom programs that will run across all the applications in the suite.

Early testers who have worked with PerfectOffice said it arrives on 40 to 50 3½-in. diskettes. Two users said the suite loaded in 30 to 60 minutes and that installation was very simple. But one tester said it took four hours to load the product.

Stalled install

"It took me two hours one day, and I had to continue the process into the next day," said Scott Williams, director of operations at Justlaw, a software development firm that builds software for law firms. "I would assume that this is just a beta problem."

Williams speculated that diskettes he received contained an installation bug because system size and RAM allocation did not appear to be factors for the other users. All testers were using 486-based PCs or higher with varying amounts of memory. Of the two users who had no problem loading the suite, one had 16M bytes of memory, and the other had 8M bytes. Williams had 16M bytes of RAM on his machine.

A WordPerfect spokeswoman

PerfectOffice, *page 60*

Windows 95 inches toward final release

Second beta version delivers on user-awaited features

By Stuart J. Johnston

Microsoft Corp. is shipping the second major beta version of Windows 95, and this version contains almost everything promised for the final release, according to company officials.

Included in the second beta version of the next generation of Windows are the universal electronic-mail client and enhanced support for Plug and Play hardware, which was missing from the first beta, said Richard Freedman, Windows 95 product manager. Microsoft refers to this latest beta release as both "M7," for "milestone 7," and "Beta 2." It is the second and final formal beta of the product.

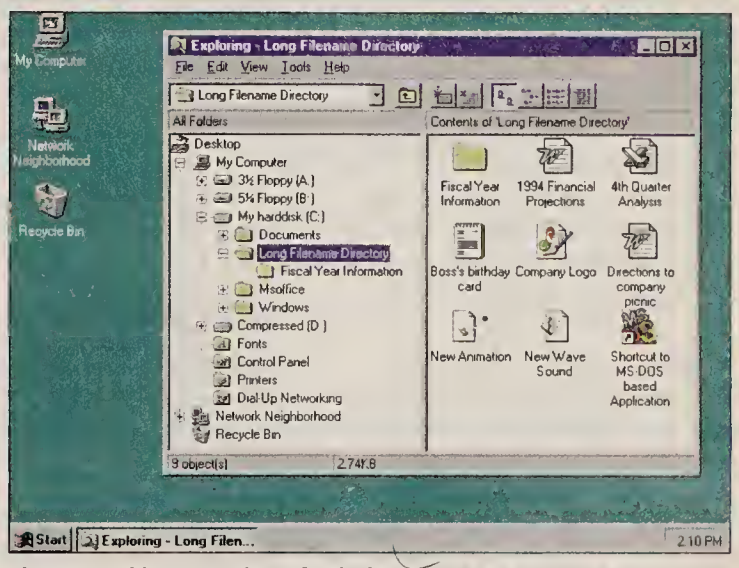
Still lacking

However, notably missing from Beta 2 is support for Radish Communications Systems, Inc.'s VoiceView data transfer technology, Freedman said.

VoiceView is a switched protocol that allows two VoiceView-enabled modems to put the voice portion of a call on hold long enough to transfer data and then switch back to the voice call. It enables users to exchange electronic documents and bit-mapped images over a single standard phone line while a voice call is in progress.

That support is not included in Beta 2, but Microsoft officials said they will add it to the product in time for commercial shipment.

Between Beta 2 and the product's commercial release, which is due by the end of June 1995, the company plans a large-scale "Preview" program. For Preview, Microsoft will sell the post-beta code to more than 100,000 users for a "nominal" fee meant to cover the cost of manufacturing and shipping the disks to users.



The second beta version of Windows 95 *includes Microsoft Exchange, which provides integration of fax data with E-mail messages*

Even though it still lacks some key features, many beta testers said they were pleased with the stability of the first beta, which was released in June [CW, July 4]. There have been several interim releases since then with added

Windows 95, *page 56*

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Spreadsheet features add up

Quattro Pro gets more connection tools

By Jeff Angus

Quattro Pro has been the spreadsheet to use for graphs or to deliver an end product as a report. The new version, 6.0, continues that dominance but adds analytical and productivity tools while catching up with competing products in the Windows-ness of its interface.

The product is now produced by Novell, Inc./WordPerfect Corp., which acquired it from Borland International, Inc. several months ago.

The first major enhancement is a strip of controls called the property band that makes quick work of formatting (fonts, lines, zoom, text alignment, number format, etc.) by condensing those commands into a concise area.

Other new productivity features bring the product into the same weight division as major competitors Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Excel. The Formula Composer, for example, gives users the ability to build complex calculations in a hierarchical outline format that makes creation faster and debugging much easier.

Bigger now better

More customization in the SpeedFill feature lets users build vast swaths of formulas. The SpeedForm feature applies multiple formatting commands simultaneously, making building bigger models easier.

And 17 QuickTemplates, predesigned workbooks for tasks as diverse as accounts receivable and room scheduling, make standard number-crunching more productive. Building your own templates is reasonably straightforward, but this first effort does leave room for improvement.

Quattro Pro 6.0 has significantly improved its ability to integrate its files over the network and with other applications. The program supports Microsoft's Object Linking and Embedding (OLE) 2.0 as both client and server, and its OLE performance as a client is the most responsive of any application we have tested.

The program supports publish and subscribe functions over Messaging Application Programming Interface, MCI Communications Corp.'s MCI Mail, Lotus' CC:Mail, Message Handling Service and other transports.

The product still has the slick application programming interface (API) for accessing relational databases. This latter feature, renamed IDAPI (Integrated Database API), is very sensible, nurturing the retention of database data in database products and letting information systems professionals fight the dysfunctional tendency of end users to put database functions in spreadsheet applications.

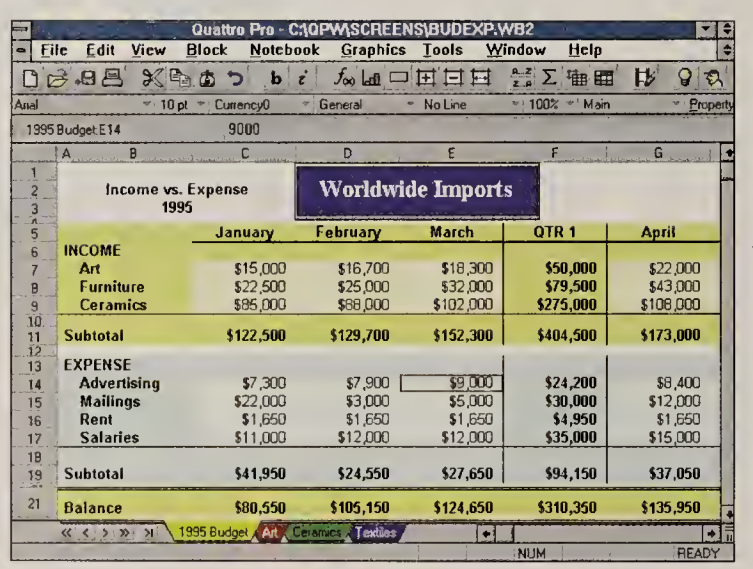
More Windows-like interface

Quattro Pro's DOS roots showed in its previous Windows interface, a circumstance this new version addresses with a makeover, for better and for worse.

For one thing, Version 6.0 has far more drag-and-drop capabilities, which makes some editing tasks quicker. At least one feature is a mite irritating, though. If a user clicks on a cell and holds it for more than a second, the cursor turns into a hand that allows him to drag the contents of the cell to another location. If a user is not used to this, it is too easy for him to start a range selection and end up moving a cell instead.

These changes add to Quattro Pro's value in sites that are standardized on Windows applications. For sites that are standardized on or are considering standardizing on WordPerfect's PerfectOffice applications suite, there's even more added value — all the programs in the suite (WordPerfect, Presentations and InfoCentral) share common tool bars and menus with Quattro Pro.

Of course, while this pays off for suite users, the related debit is that the interface cannot be optimized for any single application. All must be homogenized to a common denominator to the deficit of each individual's purpose.



Quattro Pro 6.0 *has greater ability to integrate its files over the network and with other applications*

Even more graphics

The spreadsheet also picked up new features in its area of greatest advantage. There's now a Graph Gallery, a set of templates for graphic output. The new Graph Advisor tries to apply some artificial talent to help users choose a graph to best display results. Users use slider bars to indicate three criteria of the underlying data, and the Advisor suggests a chart type and a color scheme.

The printed documentation is very good — both well written and well organized — although the index is spotty and missing some entries. If users get the CD-ROM version of the software, they also get an electronic replica of the paper manual, presented in Novell's Envoy viewer.

Quattro Pro for Windows 6.0 lists for $395; the competitive upgrade price is $99. Upgrades from previous versions cost $49.95. WordPerfect's information number is (801) 225-5000.

Angus is a project director at The Data Works Ltd. in Seattle.

1-2-3 for Windows adds speed

By Al Giovetti and Jeff Angus

Lotus Development Corp.'s newest 1-2-3 for Windows, Version 5.0, is important to users for three reasons: improved speed, integration with Notes and new specialty features.



The most notable specialty feature is the fully integrated Maps, a powerful, no-extra-cost utility. Maps extends the already solid feature set of 1-2-3's charts, adding options for those who calculate or present data by state, region or country. Maps plots continuous numerical data ranges geographically, with six colors and six hatch patterns to accommodate two variables.

Among the more ordinary but very useful new features are file import capabilities. Release 5.0 will directly open Excel 5.0, Paradox and dBase files, but it will not write the Paradox or dBase formats. Lotus 1-2-3 currently does a better job of importing ASCII files and automatically parsing them, although it will ask for your help.

The new features save time — and save users from unrewarding tasks.

Hard @ work

Because spreadsheet publishers believe there can never be enough @ functions, Lotus added 16 to Version 5.0. Most useful are @ISEMPTY, for better conditional processing of macro code, and @CELL, for formatting of individual cell text, color and patterns. The @MINLOOKUP and @MAXLOOKUP functions provide highest- or lowest-range cell addresses.

Version Manager is a productive addition, supporting a user's ability to save sets of data and use them as named ranges. This is most useful when you conduct "what-if" analyses with sets of interdependent projections that must be tested together.

Notes' workgroup enhancements include increased Notes/FX 1.1, NS4 file type, Open Database Connectivity and Notes SQL integration, making 1-2-3 the best spreadsheet for teams using Notes, Vendor-Independent Messaging, CC:Mail or Messaging Application Programming Interface-compliant workgroup connections.

Range Routing sequentially or simultaneously delegates all or part of a spreadsheet to anyone on the network and provides dialog boxes with attached notes and buttons to return, merge and route updates and comments on a range or spreadsheet.

Increased integration with Lotus' SmartSuite 3.0 Approach database makes 200 Approach commands available from within 1-2-3. Dynamic Crosstabs allow the user to rearrange tables with the mouse and summarize and report on the data. If the spreadsheet data changes, Approach updates the dynamic crosstab.

For the masses

Each of these features helps a minority of end users with more specialized needs, but Lotus did not ignore the vast majority of users who use a spreadsheet to get work done faster. For them, there are some notable new productivity features.

Version 5.0 supports Microsoft Corp.'s Object Linking and Embedding 2.0 and drag-and-drop operations between worksheets and other applications. Drag-and-fill, a Lotus innovation, lets users define part of a series, select an area and have 1-2-3 fill in the selected area with the logical series, a real time-saver.

Similarly, users can use Fast Format to select an area with complex formatting, press a button and "paint" a new selection with all the elements of the original formatting. There is also a robust set of slick, usable templates for common tasks. These kinds of features save time and, more importantly, save users from the most menial and unrewarding tasks.

Release 5.0 stands as a significant enhancement for those working with other SmartSuite 3.0 programs within the Notes application development interface. The spreadsheet-only enhancements may not justify an upgrade for stand-alone users unless the productivity features will make a difference to them.

Release 5.0 has an estimated retail price of $329; the competitive upgrade and upgrade from previous versions is $105. Lotus' information number is (800) 343-5414.

Giovetti is a certified public accountant in Catonsville, Md. He also teaches an undergraduate Lotus-based accounting course.

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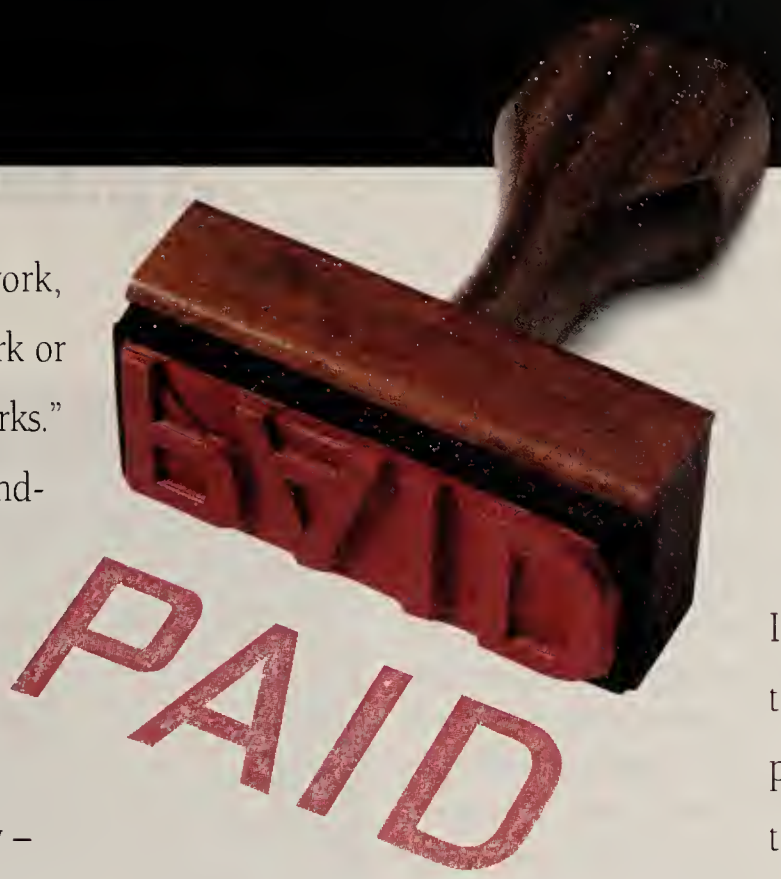
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IDC
INTERNATIONAL DATA CORPORATION

Insight: An Ex

Maximizing Return from

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Equipping teams of mobile workers with notebook computers giving them access to the same automated tools and information their desk-bound peers enjoy makes intuitive sense. But does it make good business sense? The answer is a definite yes.

This is a key finding of a recent study of more than 400 large and medium-sized U.S. organizations involved in field force automation, conducted by International Data Corporation, the world's leading information technology market research firm.

The business case for automating the field force is reported in this Insight. An in-depth discussion is available in a special IDC White Paper, *Field Force Automation: The Keys to Success* (see box, far right). The White Paper also details key factors of a successful field force automation program discussed in an earlier Insight.

The best protection for an initial investment in field force automation is continued investment

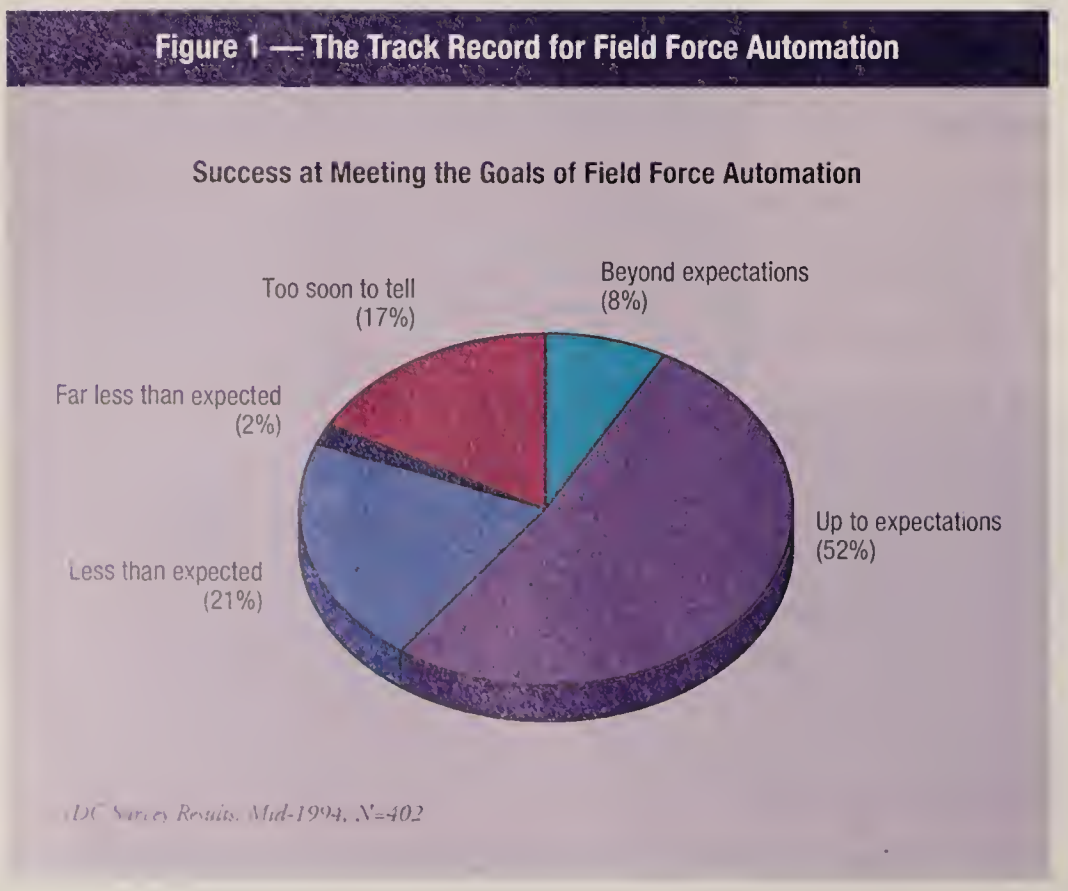
According to the companies and government agencies polled, the business case for field force automation generally requires achieving a measurable return on investment (ROI). In order of importance, ROI was measured in terms of:

- Internal productivity, such as order processing time, transaction rates, and revenue per employee
- Customer service, from satisfaction ratings to call handling and order turnaround statistics
- Field force approval, as evidenced in formal polls, actual usage of the application, and continued funding by field management
- Enhanced competitiveness, based on both informal feedback and on competitive operational measures, such as mean-time-to-repair, transactions per employee, or sales costs
- Financial returns, such as increased revenues or profits and other formal ROI calculations

Against these yardsticks, American companies generally report field force automation success ratios as shown in Figure 1.

Over 25% of respondents felt that field force automation had given them a sustainable competitive advantage. Given that over 70% of large and medium-sized organizations in the United States are involved in field force automation—generally in their second or third generation—successful field force automation is likely to become a key factor in business success.

Figure 1 — The Track Record for Field Force Automation



Key Benchmarks

- Average field force automation projects take 21 months from design through implementation and rollout.
- 45% of the costs are incurred in the first year of implementation for companies with a planning horizon beyond one year.
- 60% of companies felt their implementations met or exceeded expectations.
- Average first-year investment level is $6,400 per user.
- Average investment payback period is 2.6 years.

How Big an Investment?

The typical organization had dozens of workgroups. The average line manager's workgroup size was 100, and notebook computers were routinely ordered by the hundreds.

Automating a field force then is not just supplying workers with notebook computers and copies of Microsoft Office. It is a full, enterprise-wide application taking several years to implement (see Figure 2) and impacting thousands of employees.

The investment required is not trivial. Companies in the IDC study reported an average first-year implementation cost per user of $6,400, broken down as follows:

- Hardware, 50%
- Packaged software, 20%
- Internal software development, 15%
- User training, 9%
- Consulting, 4%
- Other staff, 4%

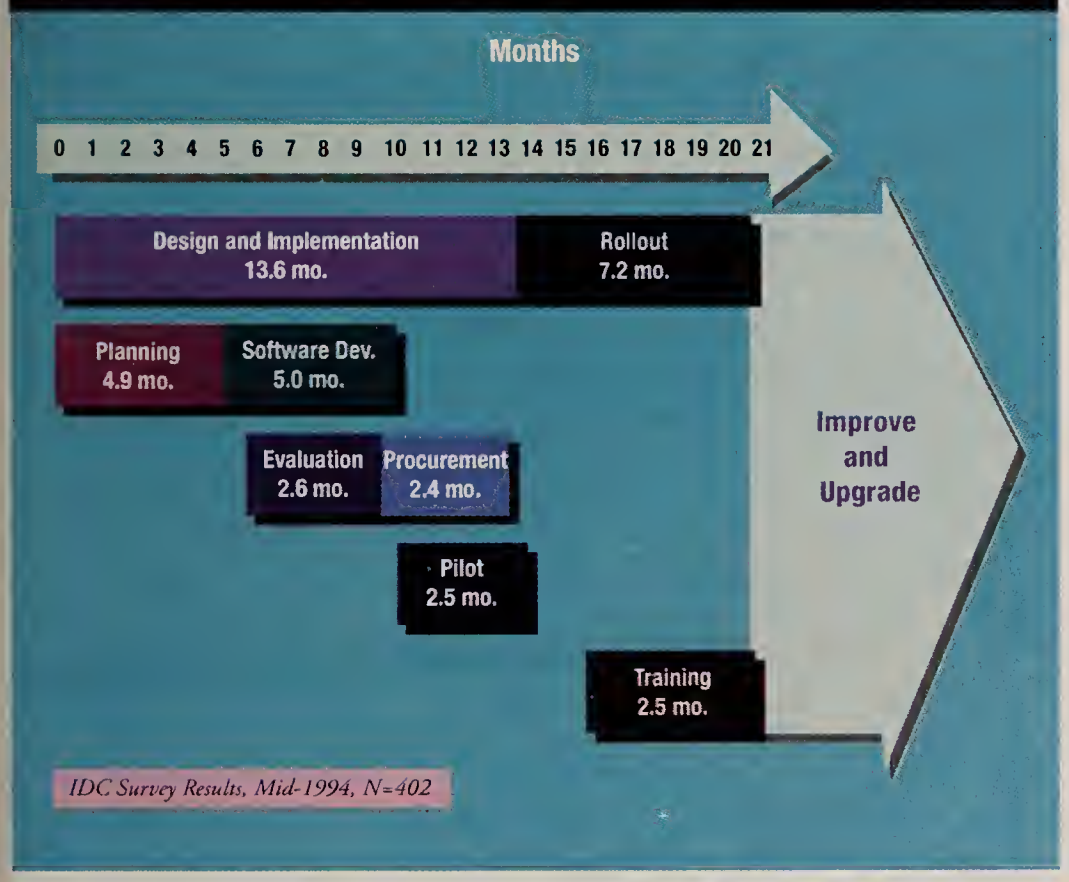
Cost-per-seat figures may, however, understate infrastructure costs such as

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Field Force Automation

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Figure 2 — Implementation Cycle Time



training, applications development, system and network management, phone bills, and overhead that are generally built into operating budgets. Unexpected problems during implementation in training, end-user support, and communications also caused unbudgeted expenses.

While the costs of field force automation may have been understated, the financial benefits probably were as well. The dollar value of an additional point of market share or a 10% improvement in customer satisfaction rating can be in the millions for a large or medium-sized company. Soft dollar returns actually may be bigger than hard dollar returns.

Protecting the Investment

Establishing an application is one thing—keeping it running and competitive is another. According to those companies claiming field force automation had given them a competitive advantage, the best protection for an initial investment was continued investment. Technology upgrade—improved hardware and software—was cited as most critical for ongoing success.

The need to keep upgrading will not diminish. Today's notebook computers are lighter and more powerful, batteries last longer, and desktop expansions and wireless networks make connectivity easier. Dollars spent on upgrading and improving field force automation hardware and software will go even further than those spent on initial implementation.

A major source of investment protection comes in the wise choice of vendor and technology. The average application takes one to two years from design to full rollout, and the average investment payback period is close to three years. The relationship between customer and supplier is long term in nature.

A supplier must have top-notch service and support, wide geographical reach, a continually refreshed product line, and a company reputation and viability beyond concern. The supplier must also understand the need for programmed upgrades and asset management, and be willing to disclose its own product plans and business directions.

The valuable vendor in today's mobile marketplace will provide its client a technology road map that offers guidance in deploying management resources, scheduling technology upgrades, and disposing of outdated equipment.

Only after a vendor meets these criteria does product price become an issue. The annualized cost of that notebook computer in a salesperson's briefcase is less than 1% of the investment in salary and overhead to keep them in the field. Quality equipment is a minimal expense in the total success formula.

The Call to Action

The research clearly shows that the business case for field force automation is a strong one. Payoffs are real and measurable. Achieving them is a matter of careful planning and execution: maintaining them requires continued commitment and ongoing technology investment—an investment with substantial return.

– John Gantz
Senior Vice President
International Data Corporation

Variations in the Field

Experiences with field force automation in the IDC study varied depending on industry and the area automated.

- Sales and marketing are less automated than customer service, accounting, or transaction processing functions.
- Manufacturing companies reported the highest percentage for sales automation—50% versus 35% for the total sample.
- Discrete manufacturing companies reported first-year per-user investments of $7,800, versus an average $6,400.
- Accounting and auditing applications have the shortest payback period—2.3 versus 2.6 years.
- Banks report the shortest time from design to implementation—10 months instead of 14.

This Insight was written independently by IDC and sponsored by Dell Computer Corporation. For a complimentary copy of IDC's full White Paper on Field Force Automation, please call Dell at 1-800-396-3040.

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IBM's Workplace Shell for DOS on thin ice

By Ed Scannell

After a year of promoting a DOS version of its Workplace Shell as a major advantage over Windows, IBM may be on the verge of shelving the product.

Late last month, IBM's Personal Software Products group sent PC DOS 7.0 — minus the often promoted graphical shell — into beta testing at 700 user and OEM sites. The company had originally planned to ship Workplace Shell for DOS in the first half of the year.

But IBM officials said now that they have delivered OS/2 Warp, the 4M-byte version of OS/2 that features a full implementation of the Workplace Shell, the commercial opportunities for Workplace Shell for DOS have been diminished.

When asked for comment, however, company officials stopped short of saying they plan to formally drop the product, saying they are still "considering delivery with a future version of DOS."

But one source familiar with the company's plans said IBM has already decided to drop Workplace Shell for DOS. The source also indicated there are problems beyond that of positioning the product against OS/2 Warp and Microsoft Corp.'s upcoming next generation of Windows, Windows 95.

"One major reason it will not ship is [IBM] can't make it 100% compatible with the OS/2 version. They are unwilling to compromise on the look and feel," said one developer who asked to remain anonymous.

Slow to move

While many users think having an object-oriented graphical shell on top of MS-DOS or PC DOS has some obvious advantages for tasks such as dragging and dropping, most appear willing to wait for Windows 95 to gain such capabilities.

"I liked what I saw in [Workplace Shell for DOS], but frankly, [Windows 95] is coming along nicely, from what I see. And if I want to use OS/2 for heavier-duty stuff like transaction processing, I have Warp's Workplace Shell," said Frank Landon, a senior technical consultant at a large Nevada-based bank.

Some information systems executives said a common look and feel to OS/2 and DOS would be nice because it would reduce user training costs. But because so much tinkering is needed for "user-friendly" interfaces such as the Workplace Shell, it is often easier for users to just craft their own variant, they said.

"With the standard Workplace Shell, our users were getting lost and deleting icons. Our [Workplace Shell-based] interface doesn't have an OS/2 folder on it, just icons for 3270 sessions and some desktop applications. It is like baby-proofing a house," said Ken Gable, senior systems programmer at Amerisure & Co. in Southfield, Mich.

While IBM appears to be backing off its commitment to the Workplace Shell, that is not the case with PC DOS. IBM believes there is a worthwhile economic opportunity among the broad base of DOS users who still want or need technical improvements for DOS.

"While we are aiming Warp at the broad-based market, we still see lots of life left in the DOS market," said Wally Casey, director of marketing at Personal Software Products.

In recognition of the growing market for portable computers, Personal Software Products has added File Up, a file synchronization feature that allows PC DOS 7.0 users to automatically update the same file across laptop and desktop computers. The company has also improved the product's E text editor with pull-down menus, mouse support, a more intuitive graphical interface and the ability to configure tabs and margins.

Personal Software Products also included an improved version of Stac Electronics, Inc.'s Stacker 4.0 disk compression software, which offers a compression ratio of more than 2-to-1; support for the Rexx for DOS programming language; slight improvements to the memory manager; and support for PCMCIA Type II cards.

PC DOS 7.0 is expected to be available by the end of first-quarter 1995.

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1992/ Apple PowerBook 180	68030	80M OR 120M BYTES	6.8 POUNDS (MONOCHROME)	2½ TO 3 HOURS
1993/ NEC Versa 50E	I486 SL ENHANCED	210M OR 340M BYTES	6.2 POUNDS (MONOCHROME); 6.9 POUNDS (COLOR)	5 TO 7 HOURS (MONOCHROME); 3 TO 5 HOURS (COLOR)
1994/ Toshiba T4900	PENTIUM	770M BYTES	6.9 POUNDS (COLOR)	2 HOURS

Source: Arthur D. Little, Cambridge, Mass.; Company reports

Windows 95 nears final release

CONTINUED FROM PAGE 47

features such as the universal E-mail client.

In Beta 2, the universal E-mail client (formerly the Info Center, now called Microsoft Exchange) provides integration of fax data with E-mail messages. It also includes support for Internet mail as well as support for CompuServe access and Microsoft Mail messages, Freedman said.

The Internet mail feature will let users download the header information from messages so they can choose which messages they want to download, rather than having to download all of them.

The earlier beta of Windows 95 "always had a stable engine," said Briscoe Stephens, coordinator for space sciences in the Advanced Scientific Information Systems group at NASA in Huntsville, Ala. With Beta 2, "the fax capability is in there, and they've improved the mail client [including the] Internet capabilities, and now the NT [versions of] Word and Excel work with it," added Stephens, who received Beta 2 last week.

It's a Windows world

There are currently more than 60 million units of Windows installed worldwide.

Plug and Play support

Another new feature in the upcoming beta is improved support for Plug and Play hardware. This is a key issue for many corporate microcomputer managers because the hardware promises to greatly reduce local technical support costs when users upgrade their systems with add-on hardware devices.

In recent briefings, Microsoft also demonstrated a growing range of PC hardware that supports the Plug and Play specification, including desktop and laptop PCs from six major vendors. Additional hardware that supports Plug and Play includes network and SCSI adapters, hard disks and CD-ROM drives, fax modems, audio and display cards, monitors, mice and printers.

Stephens agreed that Plug and Play support for peripherals works better in Beta 2. "I was having some problems [with the first beta], but that seems to be working OK now," Stephens said.

All in all, more than 100 Plug and Play products are shipping or will ship soon, according to a Microsoft catalog distributed during the briefings.

"Microsoft is on a good track to getting a product that people can really use, and having now seen the Plug and Play technology well demonstrated, I can predict no more Saturday afternoon nightmares" performing after-hours hardware upgrades when technical support is not available, said Chris Devoney, a Seattle-based author of books on DOS and Windows.

Whoops feature

Beta 2 also includes many more subtle additions such as a multilevel "undo" function that lets users undo many common operations such as file delete, move, copy or rename.

"It's one of those small conveniences that makes life a little easier," Devoney said.

For Windows 3.1 users, Beta 2 features a "guided tour" that demonstrates how to operate the new graphical user interface and other functions. The system also has integrated support for Windows 3.1 to help users convert.

Windows 95 will also be able to run custom CONFIG.SYS and AUTOEXEC.BAT files for DOS sessions, and it will have protected mode support for the DriveSpace and DoubleSpace disk compression utilities.

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Commentary

Carole Patton

Bundles are bad news



Windows 95 is not just an operating system. When it arrives next spring, this tour de force from Microsoft will replace all those (formerly) separate utilities you probably have on your PC right now, such as fax software, E-mail and communications capabilities. Especially neat here is that all these built-in Windows applications will be tightly integrated into a single common interface and even a central database of names and addresses.

In fact, Windows 95, the next generation of Windows, is such a complete operating environment that you may never have to purchase another Windows utility again. Nice for you. Not so nice for software developers such as Lotus, Delrina or Symantec, whose Windows products are about to become "buggy whips" in the name of progress. Microsoft is even including a somewhat feature-limited version of its best-selling suite, Microsoft's Office, in Windows 95.

> The bundling strategy is a prescription for destroying the Windows service applications market.

This strategy is a prescription for destroying the Windows service applications market and damaging (if not terminating) the market for core business software. For example, what if you buy a laptop preloaded with Windows 95 and Microsoft's Office. Will you then go out and buy SmartSuite from Lotus or PerfectOffice from Novell? Probably not. Consumers aren't interested in replacing "good enough" with "great." Most new car buyers keep the standard radio their car came with. Only a handful are willing to shop around and pay a premium for better audio quality.

Bundle bandwagon

Microsoft is not alone in pursuing a bundling strategy. IBM's OS/2 Warp Version 3.0 ships with a Bonus Pak that includes a word processor and a spreadsheet (IBM Works), plus a host of third-party software.

These "free" goodies help sell the product and anoint those vendors whose software is bundled — "It's in there; it must be good," users think. But such a strategy also leaves out in the cold any vendor whose software was overlooked.

While bundling is arguably anticompetitive, the issue has expanded with Windows 95. IBM's Warp cannot claim the same high level of integration of Microsoft's standards, such as the internal communications process embodied in Object Linking and Embedding (OLE).

Take, for instance, Lotus' SmartSuite 3.0 for Windows, released in September. For all intents and purposes, SmartSuite is an office in a box. You get a word processor (Ami Pro), Lotus' famed 1-2-3 spreadsheet, a database (Approach), a calendar program called Organizer and Freelance Graphics presentation software. Lotus' SmartCenter tool for switching among these applications is nifty.

However, Lotus SmartSuite programmers were able to provide support for only part of the OLE 2.0 specification: the drag-and-drop among 1-2-3, Approach and SmartCenter. Microsoft's Office, on the other hand, supports OLE 2.0 across the board. (It *is* Microsoft's standard, after all.) It is so tightly integrated with Windows 95 that removing it to make room for SmartSuite may not be practical.

I've long thought that by selling both systems and applications, Microsoft would gain advantages that could eventually terminate competition among Windows vendors. This is especially evident now. With hardware prices dropping so fast, Windows (and Windows applications) could become "disposable" thanks to Windows 95. You won't ever have to replace or upgrade programs. Just buy a new PC that comes complete with all the software anyone is ever likely to need.

Sees their side

I can't blame Microsoft or IBM for trying to create a complete operating environment. We are leaving the era when users cared about software and took the time to learn a variety of different packages and understand the differences. Most computers today are being bought by novice PC users, and these newcomers require software that is easy to use. They want Windows point-and-click software, not arcane commands.

But I believe competition is, for all practical purposes, "locked out" when operating systems developers can integrate their own applications and so much "free" third-party software in a single, seamless package. If this doesn't raise a red flag in the offices of the U.S. Justice Department, then our regulators are asleep at the switch.

Here's the bottom line: Will you be better off five years from now without Lotus' SmartSuite for Windows? Without PerfectOffice? Without WinFax? Without any choice?

Patton is chief analyst at the Mendham Technology Group in Mendham, N.J., and publisher of "Windows Letter," a newsletter for corporate decision-makers. Her book, *OS/2 Goldmine*, will be available from Van Nostrand Reinhold in March. Contact her through MCI Mail at 401-4869 or via CompuServe at 73700,2503.

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PerfectOffice beta offers first look

CONTINUED FROM PAGE 47

said working out the installation problems is the main reason PerfectOffice has not yet entered production shipment. All users recommended that WordPerfect release the product on CD-ROM, saying the number of diskettes in the beta version is excessive.

Not all the users were able to work with the integrated application features in PerfectOffice, such as Microsoft Corp.'s Object Linking and Embedding (OLE) 2.0; PerfectScript, the suite's scripting language; or the Desktop Application Director (DAD), a customizable tool bar that enables a user to launch applications from within the suite. But those who worked with these features said they were impressed with their performance and capabilities.

Scripting wins raves

"I thought their scripting language, PerfectScript, was like nothing else I've seen in other office suites," said Paul Dalton, a partner at Jackson & Walker, a law firm in Dallas. After writing an automation script, the user simply has to press a button on the DAD bar, and the application is automatically loaded, Dalton said. Using OLE automation, the application or task can then be linked to another application in the suite automatically.

"Then, when the automated task is finished, a menu pops up asking if you want to E-mail it, fax it, save it or spell check it," Dalton said. "It's a really nice, easy-to-learn cross application approach."

All three users said that almost all the individual applications in the suite performed very well. However, Williams, the user who had trouble loading his beta version, said he suspected that Envoy, a workgroup publishing tool, was not quite ready for prime time. He said the application exhibited backward compatibility bugs and that many README files shipped with the program.

Roll call

PerfectOffice Standard includes the following:

- WordPerfect word processor.
- Quattro Pro spreadsheet.
- WP Presentations, a graphic application.
- InfoCentral, a personal information manager.
- Envoy, a workgroup publishing tool.
- GroupWise: E-mail, calendaring front end.

In the running

At one site, where a number of users use Microsoft's Office, PerfectOffice made a favorable impression. Scott Johnston, network administrator at Georgetown University in Washington, said PerfectOffice is a solid contender, particularly for current WordPerfect users who want to upgrade to an office suite. Because of WordPerfect's generous discounts for academic sites, Georgetown already has a large WordPerfect population.

"PerfectOffice is as good a suite as Microsoft's Office," Johnston said. "When I consider how many WordPerfect users here have not upgraded to a suite or have not given up their word processor, I see how it could fill a nice niche here."

Digital throws hat into PC retail arena

By Mary Brandel

■ At least two retailers will be making room on their shelves for Digital Equipment Corp.'s Starion line of PCs, the company's first retail offering since its ill-fated Rainbow PC.

Starion targets small businesses of fewer than five employees. For larger organizations, Digital recently introduced three Alpha AXP-based 64-bit workstations and five servers (see chart).

SYSTEM BLITZ

Digital has enlarged its Peripheral Component Interconnect lineup with workgroup and departmental servers

AlphaServers	Windows NT	OSF/1 or OpenVMS
1000 4/200	$15,970	$17,900
2000 4/200	$18,070	$23,900
2100 4/200	$21,940	$30,980
2100 4/275*	$33,390	$44,900

*Also available in a cabinet version

The five new PC models — with processors ranging from a 66-MHz 486DX2 to a 90-MHz Pentium and priced from $1,699 to $2,399 — "have all the ingredients of a success story," said James Greene, an analyst at BIS Strategic Decisions in Norwell, Mass. Features include a built-in answering machine, a fax/modem, conferencing software and CompuServe access.

Supply for demand

Digital may do well simply because it has Pentium systems to offer. "Pentium is in tight supply," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. "A lot of companies won't be able to meet demand."

The days of the failed Rainbow systems "are long over," said Jonathan Eunice, an analyst at Illuminata in Hollis, N.H. "Digital has learned a large number of lessons about designing for the low end." Plus, "You can't talk to a Digital executive without hearing about how they're going to do better with partners."

CompUSA, Inc. and Sam's Club have signed exclusive agreements to sell the PCs.

But users may be surprised by the higher list prices on Digital's new server models. But Peter Miller, director of Alpha platform marketing, said the prices reflect the company's new channel-oriented pricing strategy, characterized by "higher prices and higher discounts."

The new models are priced 9% higher than if Digital sold them directly, he said. The 2100, announced in April at $26,900, has increased to $30,980. This, Miller said, gives channel partners more flexibility in their pricing.

At least one user thought the pricing was fair. The New Mexico Department of Public Safety paid $26,000 earlier this year for the four-processor 2100 Model 500, said Raymond Vijil, technical director of the criminal justice information systems. He added that "$18,000 isn't bad [for the dual-processor model], if you don't have to go to four CPUs in the future."

Four of the five new servers — the uni- and dual-processor and two quad-processor models — and all of the workstations are Peripheral Component Interconnect-based (PCI) and run Microsoft Corp.'s Windows NT and Digital's OSF/1 and OpenVMS.

The eight-processor DEC 7000 Model 700 still uses the TurboLaser bus but will be upgradable to the PCI-based model due out next year. PCI is critical because it sets these systems up for low-cost clustering expected next year, Eunice said.

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"Users were ecstatic and are more productive as a result of uni-SPF." *--AT&T*

"Normal use of uni-XEDIT and uni-REXX is going so smoothly there has been no need for their support desk."
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--Allison Engine

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Briefs

Bell boosts services

Bell Atlantic Corp.'s computer service unit expanded its remote technical support offering with seven new services targeted at desktop and PC LAN environments. The services, which operate out of Bell Atlantic's telephone support center in Frazer, Pa., cover desktop PCs plus Novell, Inc.'s NetWare 2.x through 3.12 releases. Bell Atlantic Business Systems Services said it plans to add support for NetWare 4.x, Microsoft Corp.'s Windows NT Advanced Server, Banyan Systems, Inc.'s Vines and Lotus Development Corp.'s Notes early next year.

Iomega, Conner settle suit

Iomega Corp. and **Conner Peripherals, Inc.** settled a patent infringement suit, which resulted in Conner agreeing to take a royalty-bearing license from Iomega.

New version of Word to ship

A **Microsoft Corp.** spokeswoman last week said the firm is producing native versions of Word and PowerPoint for the Power Macintosh and that the word processing and presentation programs will ship early this month.

THE PROMISE OF WINDOWS NT HAS FINALLY BEEN DELIVERED.

FedEx, UPS to deliver on-line ship info to desktops

By Julia King

Neck and neck out of the gate, industry and high-tech rivals FedEx Corp. and United Parcel Service, Inc. recently announced competing plans for furnishing on-line access to shipping services from users' desktops.

Beginning early next year, the home office and small business users targeted by both services will be able to place orders and track shipments from their PCs. Currently, only the companies' largest customers — using proprietary hardware and software furnished by FedEx and UPS — can perform these tasks.

"The bottom line is that both companies are still moving boxes from point A to point B," observed Gregg Smith, vice president of Colography Group, an industry consulting firm in Marietta, Ga. "The value they're adding with the services is information, which is what continues to differentiate them."

FedEx Chief Information Officer Dennis H. Jones said the company's new Powership product moves the Memphis-based shipping giant one step closer to its goal of conducting 100% of all customer transactions on-line by the end of the decade. About 60% of its volume now originates from automated technologies.

"What we're doing is expanding the capabilities of our [existing] Powership network [used by large customers] to a software-based product so that we're able to bring full end-to-end shipping capabilities to the desktop," Jones said.

FedEx has formed an alliance with IBM, Apple Computer, Inc., Intuit, America Online, Inc. and CommerceNet, Inc. to distribute the client/server-based software, which was developed in conjunction with The Windward Group in Los Gatos, Calif.

A Windows version of the new FedEx ship program will be available in the first quarter of next year, Jones said. It will be followed by a Macintosh version. Both will be furnished free to FedEx customers who request the software packages.

As part of the deal with IBM, the FedEx software will be preloaded on several IBM PCs, including IBM 300 and 700 models and Aptiva and ThinkPad units.

UPS offerings

Atlanta-based UPS is offering its customers on-line access through CompuServe and Prodigy. But unlike FedEx customers, UPS shippers cannot track packages using these services, a UPS spokesperson said. "Right now, customers can send messages to UPS and order software, but we're not tracking through it yet," the spokesperson said.

UPS also said it will unveil a Windows-based software package for customers at the Comdex/Fall '94 trade show this week. Among other things, it will integrate separate customer shipping and tracking processes. Like the FedEx product, it will allow customers to track packages from their PCs using a commercial on-line service. It will also be free.



To help your company keep up with whatever the future may bring, you need a flexible computer system that can change as your company's business needs change. So before you invest (or re-invest) in a proprietary system with an uncertain future, consider the HP 9000 Business Systems from Hewlett-Packard.

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Briefs

Maxtor ships Type II drive

Maxtor Corp. last month announced the first hard drive to fit in a PCMCIA Type II slot. Maxtor will ship 85M- and 120M-byte versions of its MobileMax Lite hard drive that run at 3.3V. The drives could boost the handheld market when they become available in volume in the second half of next year. Vendor evaluation units will be available in first-quarter 1995 for $449 and $499, respectively.

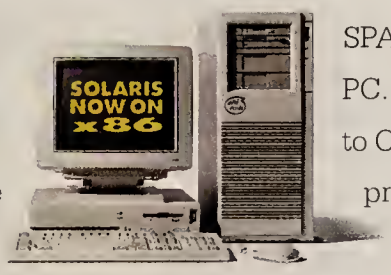
Sales force tool unveiled

Fastech, Inc., a sales force automation specialist in Broomall, Pa., released FastTrack 1.0, its first sales force automation package for Windows.

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New Products

Ballard Synergy Corp. has announced d-Time 1.1, a CD-ROM accelerator.

According to the Silverdale, Wash., company, d-Time 1.1 removes all glitches and pauses from multimedia sequences and makes CD-ROM applications run as fast as those on hard disk.

Features include a Windows help program with full-motion video and time-log searches for the current CD.

D-Time 1.1 costs $69.

▶ *Ballard Synergy*
(206) 656-8070

Rupp Technology Corp. has announced RuppLynx for Wizard, an electronic organizer-to-PC linking software.

According to the Phoenix company, RuppLynx for Wizard connects high-end Sharp Electronics Corp. Wizard organizers to portable and desktop PCs running Windows.

The product includes selectable file-transfer capabilities to and from Wizard and backup capabilities.

RuppLynx for Wizard costs $109.

▶ *Rupp Technology*
(602) 224-9922

Micrografx, Inc. has announced Picture Publisher 5.0, Windows-based image-editing software.

According to the Richardson, Texas, firm, Picture Publisher 5.0 has a Command List macro that records all commands applied to the image and provides infinite undo and command layering.

The product offers support for Object Linking and Embedding 2.0 and includes bubble hints, customizable workspace and hot keys.

Picture Publisher 5.0 costs $595.

▶ *Micrografx*
(214) 234-1769

M-Systems Flash Disk Pioneers Ltd. has announced the Tiny Flash Disk, a flash disk board with a form factor of 3.55 by 1.15 inches.

According to the Santa Clara, Calif., company, the Tiny Flash Disk includes full disk emulation and an onboard expansion BIOS that enables cold boot and eliminates the need for software installation.

The product provides read/write capabilities and was designed for systems integrators requiring rugged storage capability.

The Tiny Flash Disk costs $59.

▶ *M-Systems*
(408) 654-5820

Iomega Corp. has announced the Bernoulli 230, a removable disk drive.

According to the Roy, Utah, company, the Bernoulli 230 comes in two models: The Transportable model includes all necessary software and cables for the Macintosh and PCs; the Transportable PC model includes an adapter for Plug and Play use through the parallel port of a PC or laptop.

The product has a maximum transfer rate of 2.67M bytes and comes with a 230M-byte cartridge.

Prices start at $582; each additional 230M-byte cartridge costs $99.

▶ *Iomega*
(801) 778-1000

Elektroson USA has announced Gear for Macintosh 2.4, CR-R formatting software.

According to the Bala-Cynwyd, Pa., company, Gear for Macintosh 2.4 supports digital audio, MPEG video images and CD-I files and has formatting support for CD-ROM XA.

The product allows file names of up to 31 characters and nesting of up to 12 directories. Proprietary image mastering options, subcode support and format mastering tape are provided.

Gear for Macintosh 2.4 costs $695 for the ISO 9660 version and $995 for the multimedia version.

▶ *Elektroson USA*
(610) 617-0850

Product short

Tektronix, Inc. has announced the Phaser 140, a color bubble-jet printer, and the Phaser 540, a color laser printer. The Phaser 140 was designed for small workgroups, and the Phaser 540 provides expanded networkability for larger workgroups. Cost: $1,695 for the Phaser 140, $8,995 for the Phaser 540. Tektronix, Wilsonville, Ore. (503) 682-7377.

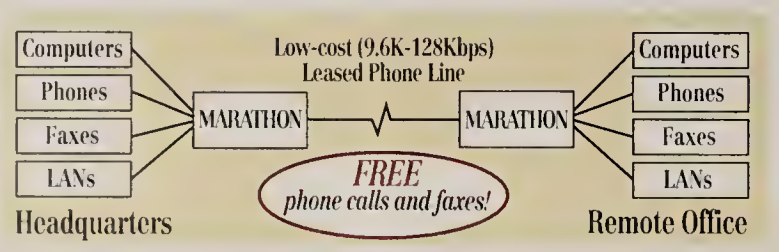


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- ☐ Workstation Access Control: A Key Element (VOL V)
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5. Which of the following products will you be evaluating:

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- ☐ C++ Development Tools Software
- ☐ Project Management Software
- ☐ Software Distributor, Inventory, Metering/Network Admin.
- ☐ Client-Server Application Development Software
- ☐ Menuing or Windows Shell Utilities Software
- ☐ Contact Management Software
- ☐ Other_____

6. What is your organization's primary business activity:

- ☐ Aerospace
- ☐ Agriculture
- ☐ Communications
- ☐ Consulting
- ☐ Education
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- ☐ Government
- ☐ Health/Medical Services, Legal
- ☐ Manufacturing - Computer Related
- ☐ Manufacturing - Non-Computer Related
- ☐ Research & Development
- ☐ Retailer/Distributor - Computer Related
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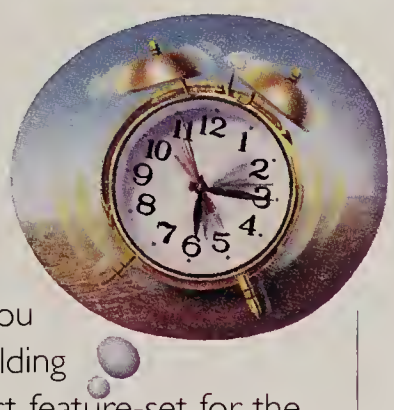




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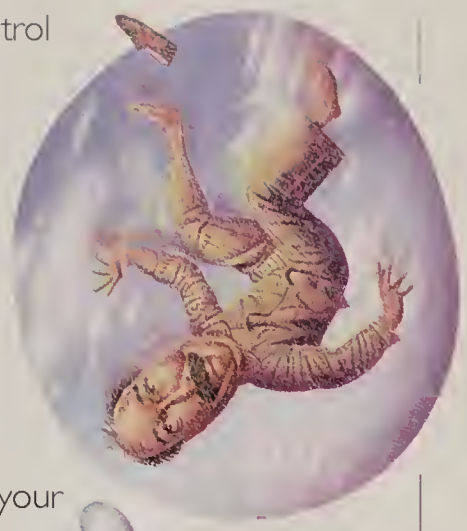


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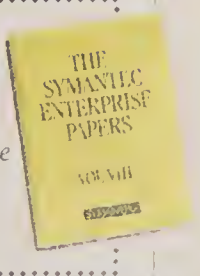
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Commentary

Ken Lownie

Good Notes help is hard to find



Despite the threat of competition from Microsoft, the reality of challenges from new, low-cost alternatives and the recent backlash against the ill-conceived Notes Express offering, Lotus continues to set the pace in groupware. Unfortunately for those of us trying to actually deploy Notes, one consequence of the produet's sueeess is a severe shortage of skilled Notes personnel.

If your goal is to find experienced Notes developers and administrators, be prepared to spend a long time looking and a bundle of money. And even such investments of time and money will not guarantee success. At the organizations I work with in my consulting practiee, such searehes have often proved fruitless, even after months of effort.

For example, Frank McIntosh, the IS manager at Cabot Corp. in Boston, is leading an enterprisewide Notes deployment and has been seeking candidates with Notes skills to fill several internal consulting positions. He reeently told me, "In four months I have identified only three potential candidates and have not yet found someone with the desired experienee."

Like many managers, McIntosh is looking for more than basie Notes skills. He hopes to find someone with business analysis, design, development, project management and change management skills to shepherd Notes projeets from eoneeption to eompletion. Simply finding a eandidate with this range of skills, even without Notes experience, would be difficult. Add the Notes requirement, and it's virtually impossible.

Search firms eonfirm the scarcity of qualified Notes help. "Demand is greater than supply. I have many more assign-

Notes help, *page 71*

Prudential takes RISC

Brokerage becomes first all-IBM trading-floor environment

By Thomas Hoffman
NEW YORK

Prudential Seeurities, Inc.'s chief information officer, Bill Anderson, has no problem with being a nonconformist.

That was evident recently when the New York-based brokerage rolled out 210 IBM RS/6000 PowerPC workstations to its equities traders and support staff. The move, part of a $25 million upgrade of its trading-floor environment, will make Prudential the first all-IBM trading floor in an industry where Sun Microsystems, Inc. systems have become the de faeto architecture.



CIO Bill Anderson *says Prudential has developed a trading-floor system that can grow over time*

Most of Prudential's trading-floor applications are developed in-house, where the firm's programmers rely on development tools such as IBM's CICS/6000 software, which has a Motif graphical user interfaee.

Planning for the future

More importantly, Prudential's decision to standardize on IBM's PowerPC technologies is based on Big Blue's plans to implement the processors across its eache of desktop-to-mainframe systems. This should provide the brokerage with scalability and eompatibility between systems throughout its eomputing enterprise.

"What we have done is develop a produet that has been built to grow, to be viable over an extended period of time," Anderson said.

For example, the IBM RS/6000-based trading-floor environment will now be more compatible with Prudential's quantitative analysis department, which relies on a cluster of five IBM RS/6000 Model 990s to cruneh market data for traders. Prior to the upgrade, Prudential traders worked on two or three IBM 3270-type terminals that ran Microgнosis, Inc. software to provide them with market data feeds.

Seeping in

Although Prudential's all-IBM trading-floor environment is still an exeeption to the rule on Wall Street, alternative systems such as Hewlett Paekard Co.'s HP 9000 systems and Microsoft Corp.'s Windows NT environment have reeently infiltrated the ranks of the onee-exelusive Sun club.

"Sun's heyday of ascendancy on 'the Street' is over," said Joseph Rosen, a managing director at Enterprise Technology Corp., a New York-based finaneial technology consulting firm. "It's getting to the point where it doesn't matter what hardware you're using since these systems are becoming much more interoperable."

Early users in Prudential's municipal bonds area welcomed the upgrades, which enabled them to consolidate multiple screens onto a single workstation by "windowing" applications on their 20-in. monitors. "We have one screen in plaee for everything, and that's been the biggest improvement," said Ed Flanagan, a munieipal bond underwriter at Prudential.

"I didn't realize what a pain in the neck running two monitors was until I started using this system" in early Oetober, added Bubba Bennett, a first vice president in national marketing in Prudential's municipal

Prudential, *page 73*

Branching out

Prudential Securities plans to migrate its branches to frame-relay technologies next year to prepare for future migration to Asynchronous Transfer Mode technologies as business needs dictate.

GroupQuest improves Notes administration

Essential Tools 2.0A automatically updates ACL

By Lynda Radosevich

Even committed Notes fans concede that large rollouts of the Lotus Development Corp. groupware classie are difficult to manage.

For instanee, there is no global method for adding new users to Notes servers and databases; nor is there any way to globally delete old users. Eaeh addition or deletion is a single, manual transaetion. This makes local Notes administration time-consuming and makes managing remote Notes servers diffieult, administrators at Notes sites say.

"It can be a nightmare," said Miehael Kasher, central Notes administrator at American Express Co. in New York. Notes servers "are difficult to manage remotely, and there are lots of tasks you have to do for each server, which adds up when you have many servers," he said.

To help address administration problems, GroupQuest Software, Inc. in Phoenix has rolled out a new version of Essential Tools, a eolleetion of Notes management add-in utilities.

Help available

Essential Tools 2.0A features a utility that lets administrators centrally manage and automatically update Notes aeeess eontrol lists (ACL), rosters of users and groups and their aeeess privileges. Eaeh Notes server and database has an ACL that administrators traditionally have had to update by hand.

"Consider a large installation where you have hundreds of servers and tens of thousands of users. You see those sites paying Notes administrators $60,000 to $80,000 to type names in an ACL," said Jon Miehaels, marketing manager for utilities at GroupQuest.

Essential Tools 2.0A lets administrators batch groups of people together and groups of ACLs together. When the administrator hits enter, all the new users are added to the new ACLs in one transaetion, saving hours of tinkering, aecording to Michaels.

"It makes it so we don't have to hire an administrator for each server in each location. It's a time-saver when making a lot of changes to ACLs," Kasher said.

Another Essential Tools utility simplifies the removal of users' database rights when they leave a firm. The Notes databases eheek a list of terminated employees before admitting users, and the utility searches every ACL in every server and removes terminated users' names.

An additional feature lets administrators globally control the group lists in the Notes name and address books.

Kasher said software is important for American Express' plans to roll out Notes to roughly 35,000 users. Although the first version of Essential Tools was immature, it appears that 2.0A takes care of the problems, he said. However, one feature he would like added, he said, is access to a roster of every list on which an individual Notes user appears.

Meanwhile, Lotus tackled separate Notes management issues with the announcement last week of NotesView server monitoring software that gathers network information and tests database replication and E-mail service.

Novell's UnixWare 2.0 feels heat from two sides

By Jean S. Bozman

Fresh out of its shrink-wrapped box, Novell, Inc.'s UnixWare 2.0 will faec a two-front marketing battle against Unix rivals that port their RISC-based software to Intel Corp. machines and against Microsoft Corp.'s Windows NT, industry analysts said last week.

Novell's multitasking, multithreaded symmetrieal multiproeessing (SMP) Unix operating system is set to ship in January [CW, Oet. 31], the eompany said.

Novell exeeutives said the prospeet of a volume-based market for Unix-on-Intel systems will draw software vendors and value-added resellers to its UnixWare 2.0 platform. "Standard operating systems and hardware have driven the desktop market," said Miehael DeFazio, general manager of Novell's Unix Systems Group. "And we see exactly the same forees at work on the server side."

However, Novell must eounter Microsoft's moves to promote NT as an applieation server in Novell's home base of PC-LAN workgroups, analysts said. At the same time, Novell will be fighting user pereeption that UnixWare is a desktop operating system. The first release, UnixWare 1.1, ran only on uniproeessors and targeted single-user applieations.

Taking on the competition

With multithreading and new graphieal administration tools built in, UnixWare 2.0 ean compete head-on with the widely used SCO Unix 3.0, the Unix-on-Intel market leader from The Santa Cruz Operation, with annual sales of 180,000.

"UnixWare 2.0 is well positioned to beeome a primary Unix application server platform," said Tom Kucharvy, president of Summit Strategies, Inc. in Boston. "But I don't see them doing what is neeessary to establish it as a strong platforin at the low end and the midrange against Mierosoft."

Novell's experienee in networking — and 2 million NetWare nodes in its worldwide installed base — eould provide a powerful inducement to ereate more UnixWare 2.0 applications, Novell exeeutives said.

But synergies between NetWare and UnixWare nodes have not yet been highlighted, some analysts said. "I'd like for them to stand up and say, 'We know networking, and we know Unix, and we're going to provide tools and utilities to help people write applications for these servers,' " said Chet Geschiekter, direetor of research at Hurwitz Consulting Group, Inc. in Watertown, Mass.

Users of UnixWare 1.1 who spoke at a recent UnixWare briefing in Hilton Head, S.C., said they welcome Novell's move to an SMP Unix system for Intel machines. Some said UnixWare's links to NetWare services, which will increase in 1995 and 1996, could give UnixWare an edge over more widely installed SCO Unix systems.

Holiday Inns, Inc. in Atlanta said it plans to pair NetWare servers with UnixWare servers at 450 international hotel sites worldwide, starting next year. UnixWare will serve as a go-between for the firm's IBM mainframe baek-end reservation systems and its front-desk NetWare hotel-management PC systems, said Don Lynch, director of worldwide hotel systems development.

"We needed a multitasking gateway to our central reservation system," Lynch said. UnixWare's tics to NetWare were a major faetor in making the purehase deeision, he said. "The UnixWare box authenticates itself to the NetWare box, whieh is doing all the file and print serviees for us," Lynch said. Expected results include reduced costs and simplified systems administration, he said.

Harry Levy, chief information officer at Men's Wearhouse, Inc. in Houston, said he plans to roll out UnixWare 1.1 to more than 200 stores nationwide. With UnixWare, stores will be more independent of the host Data General Corp. Aviion 9500 Unix computer, which supports more than 500 end users. Stores can eontinue to generate transactions even in the event of a network outage, aeeording to Levy.



Notes help

CONTINUED FROM PAGE 69

ments than qualified people," says Peter Gilbert, who specializes in the Notes market for Certified Personnel Corp. in Union, N.J. "In fact, the ratio of openings to candidates is about 3 to 1. And while both demand and supply continue to increase, I do not see the two coming into balance any time soon."

If you are lucky enough to find a candidate, be prepared to pay a significant premium for the privilege of hiring him. Notes skills on a resume are worth as much as 25% over expected salaries for similarly experienced candidates without Notes qualifications. For example, one of my clients in New York recently completed the hiring process for a Notes administrator. The salary offered was nearly $60,000, which even in the inflated New York market represents a premium of roughly 20% more than a similarly skilled NetWare administrator.

How will Notes project managers cope? Part of the answer can be found in the bull market of companies offering Notes services. Lotus claims to have formal relationships with more than 6,000 business partners in the U.S., the large majority of which offer installation and development services. And Lotus has built a consulting group of more than 300 people around Notes.

There are no bargains to be found in outsourcing Notes work, however. Contractors with even minor allusions to Notes on their resumes are charging top hourly rates — as much as $80 to $100 an hour in the Northeast. Meanwhile, consulting organizations typically get $1,200 to $1,500 a day for Notes project work.

Of course, the imbalance between demand and supply in the Notes skills market will not last forever. Jim Krzywicki, who is in charge of Notes training and certification programs at Lotus, said more than 60,000 people have taken Notes training programs in the past 12 months, and more than 5,000 are in the process of becoming Certified Lotus Professionals. At that rate, the shortage of skilled Notes professionals will not last.

Cultivate Notes resources

What can you do in the meantime? If you need skilled Notes resources on staff today, you only have two choices: Buy them (or try to) or develop them internally. In most cases, I vote for the latter.

While it is true that some things about the Notes environment are unique, it is also true that a developer experienced in other database or programming environments can build simple Notes applications in a matter of days and complex ones in weeks. It takes somewhat longer to build Notes administrative skills, but an experienced network administrator can be effective in the Notes environment within a month or two.

If you move forward with Notes using internal resources, you may still want to augment your staff's developing skills with selective use of outside consultants. With Notes, a lot of knowledge comes from doing, so an investment in that type of experience may prove effective, especially if you need to support users while your staff builds its skill set. If projects are planned and executed in a manner that ensures knowledge transfer to your staff, outside help can speed development of your staff's Notes capabilities.

If you successfully use your staff to meet your need for Notes skills through training and development, you will still face one significant risk. With their new skills and upgraded resumes, they may decide to offer their services to the highest bidder. . . . and that may not be you.

Lownie is president of Connexus Consulting Group, an Andover, Mass., firm specializing in groupware deployment and development. He can be reached through the Internet at kenlownie.connexus@notes.compuserve.com.

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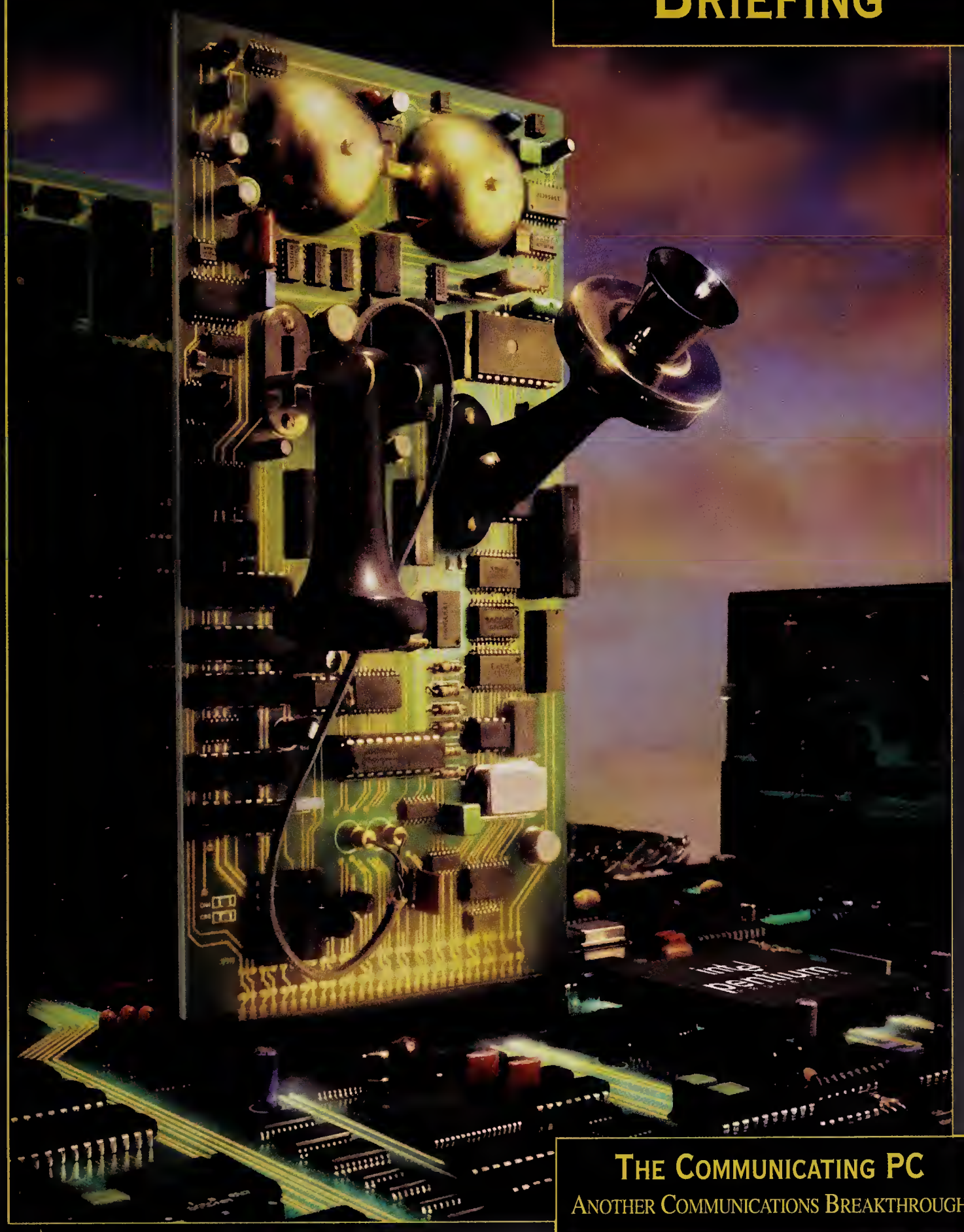
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Intel Technology Briefing



The Communicating PC

Another Communications Breakthrough

THE COMMUNICATING PC

PLUGGING COMMUNICATIONS INTO THE PC.

Originally dedicated to stand-alone computing, the PC is evolving to become the center of communication tasks. It is faxing, video conferencing, and retrieving information from many sources. This briefing discusses how Intel is working to further advance PC communications and incorporate new capabilities into the PC.

THREE TOOLS FOR THE BANDWIDTH BATTLE.

Thanks to innovations like Intel's Pentium™ processor and the PCI local bus, the PC is more powerful than ever before. And in an effort to help communication technologies keep up with these faster PCs, Intel is improving modem capabilities, supporting ISDN technology, and developing a new Ethernet standard.

MODEMS GET FASTER AND SMARTER.

Modems have been around for a long time, but their speed continues to improve. The latest modem technology, based on the new V.34 standard, has data transmission rates of 28.8 Kbps (Kilobits per second).

In addition to speed, modem capabilities are increasing. For instance, Intel and other industry leaders are improving modem technology by developing a specification for Digital Simultaneous Voice and Data. This technology splits a single telephone line into two virtual channels, enabling modems to concurrently transmit both voice and data over one line. So PC users will be able to simultaneously talk and share the same data or applications with just one telephone call.

DIGITIZING THE PHONE LINES.

Simply put, Integrated Services Digital Network (ISDN) is the telephone line turned digital. By using digital rather than analog technology, ISDN can transmit information much faster than modems. The most common form of ISDN line, called the Basic Rate Interface (BRI), contains two high-bandwidth 64 Kbps channels which allow the communication of data, voice, graphics and video at speeds of 128 Kbps.

Because ISDN sends information digitally, the telephone companies' switches must be upgraded to be ISDN-compatible. On the PC end, an ISDN add-in board similar to a modem is required to enable the PC to place and maintain calls.

After years of promise, ISDN is finally becoming widely available worldwide. It is now the standard for digital communications. Intel is fully supporting ISDN technology, and Intel's ProShare™ Personal Conferencing Software (see visual) is one of the PC-based applications that utilize ISDN's increased bandwidth capabilities.

ETHERNET PULLS A FAST ONE.

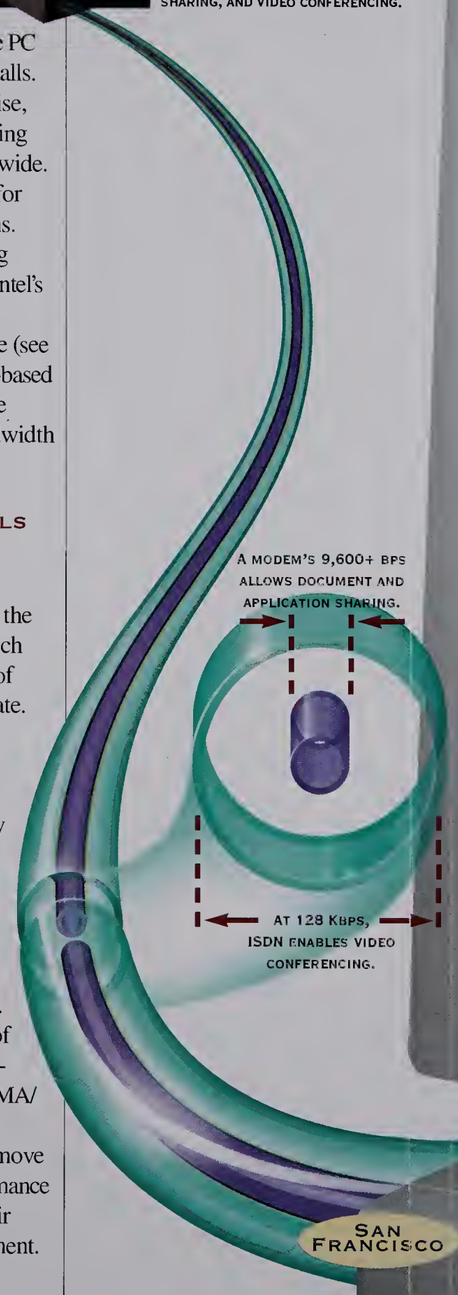
Most LANs currently deployed are based on the Ethernet standard, which provides a maximum of 10 Mbps throughput rate. But today's businesses are putting greater demands on networks and 10 Mbps is quickly becoming inadequate.

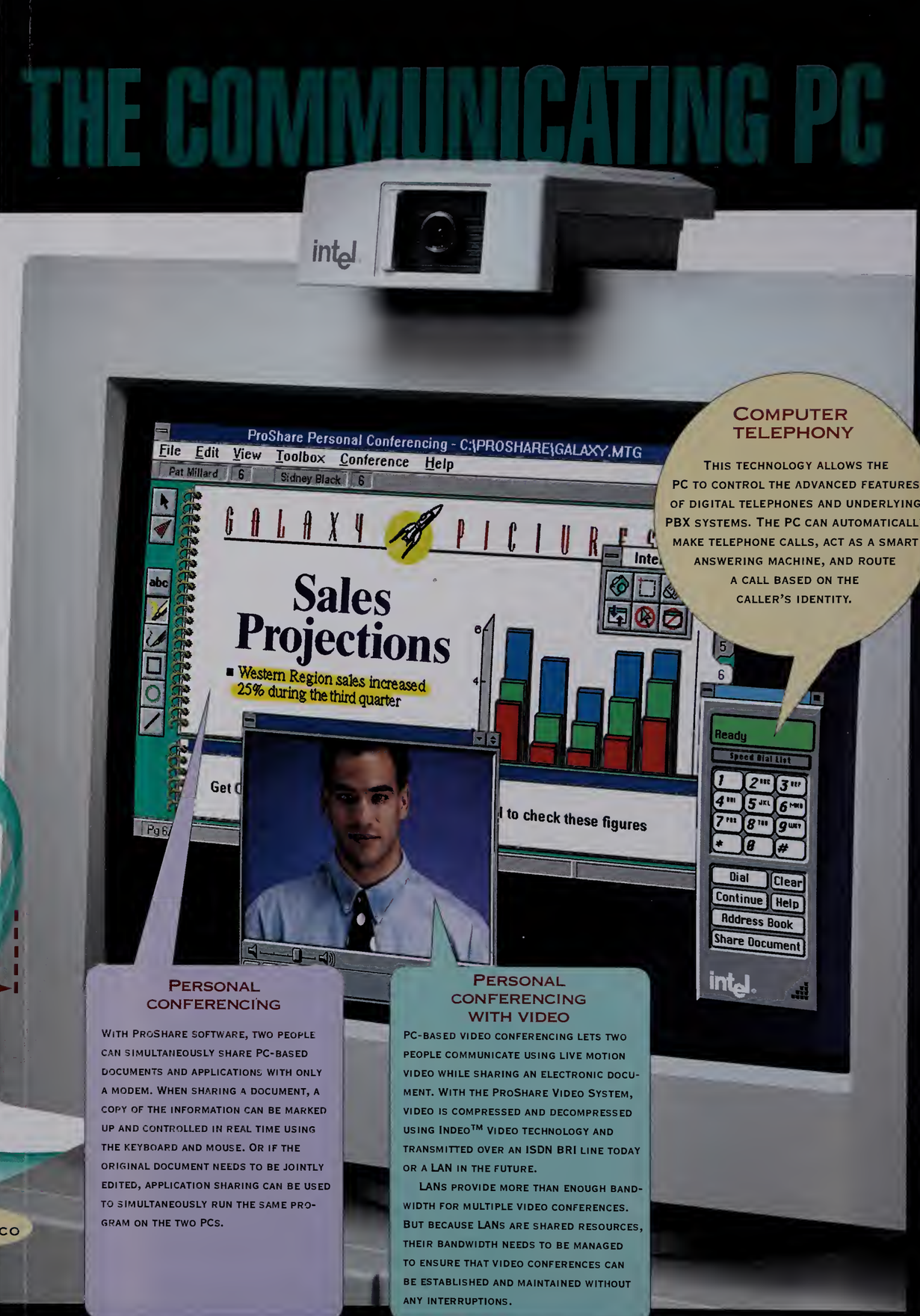
To remedy this problem, Intel worked with over 40 industry partners to develop the Fast Ethernet standard. It provides 100 Mbps of bandwidth while maintaining the original CSMA/CD protocol. This way, companies can easily move to Fast Ethernet performance while still utilizing their initial Ethernet investment.



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COMPUTER TELEPHONY

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PERSONAL CONFERENCING

WITH PROSHARE SOFTWARE, TWO PEOPLE CAN SIMULTANEOUSLY SHARE PC-BASED DOCUMENTS AND APPLICATIONS WITH ONLY A MODEM. WHEN SHARING A DOCUMENT, A COPY OF THE INFORMATION CAN BE MARKED UP AND CONTROLLED IN REAL TIME USING THE KEYBOARD AND MOUSE. OR IF THE ORIGINAL DOCUMENT NEEDS TO BE JOINTLY EDITED, APPLICATION SHARING CAN BE USED TO SIMULTANEOUSLY RUN THE SAME PROGRAM ON THE TWO PCS.

PERSONAL CONFERENCING WITH VIDEO

PC-BASED VIDEO CONFERENCING LETS TWO PEOPLE COMMUNICATE USING LIVE MOTION VIDEO WHILE SHARING AN ELECTRONIC DOCUMENT. WITH THE PROSHARE VIDEO SYSTEM, VIDEO IS COMPRESSED AND DECOMPRESSED USING INDEO™ VIDEO TECHNOLOGY AND TRANSMITTED OVER AN ISDN BRI LINE TODAY OR A LAN IN THE FUTURE.

LANS PROVIDE MORE THAN ENOUGH BANDWIDTH FOR MULTIPLE VIDEO CONFERENCES. BUT BECAUSE LANS ARE SHARED RESOURCES, THEIR BANDWIDTH NEEDS TO BE MANAGED TO ENSURE THAT VIDEO CONFERENCES CAN BE ESTABLISHED AND MAINTAINED WITHOUT ANY INTERRUPTIONS.

INCREASED BANDWIDTH LEADS TO BETTER COMMUNICATIONS



AS BANDWIDTH CAPACITIES INCREASE, SO DO THE PC'S CAPABILITIES. FOR EXAMPLE, MODEM TECHNOLOGY ONLY SUPPORTS THE TRANSFER OF TEXT AND LOW-RESOLUTION GRAPHICS. BUT ISDN TECHNOLOGY, WHICH PROVIDES A MINIMUM BANDWIDTH OF 128 KBPS, ENABLES MORE DATA-INTENSIVE PC APPLICATIONS LIKE VIDEO CONFERENCING.

A BIGGER PIPELINE, HOWEVER, IS NOT THE ONLY CRITERION. ETHERNET-BASED TECHNOLOGY IS GENERALLY LIMITED TO LOCAL COMMUNICATIONS, WHEREAS MODEMS AND ISDN LINES HAVE THE CAPABILITY TO TRANSFER INFORMATION LOCALLY AS WELL AS OVER LONG DISTANCES.

MORE PLANS FOR THE PC.

In addition to advancing PC communications and creating the ProShare™ family of personal conferencing products, Intel is working on other efforts to bring the PC and communication technologies together.

For instance, Intel is developing a high-speed cable adapter to connect home PCs to the cable network. By combining hardware and software, this adapter technology will enable the PC user to access a variety of on-line services and content through the existing cable infrastructure.

And together with 12 leading communications and computer companies, Intel is developing the Personal Conferencing Specification which will result in a wide range of interoperable conferencing products and services—from desktop to room systems. This will help make video and data calls from a PC as easy as making calls from a telephone.

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Users demand centralized management tools

Recent entries include Palindrome, upgraded Arcada

By Mary Brandel

What if you were responsible for processing Ford Motor Co.'s tax returns? Or for backing up data at the White House? Chances are you would want some sophisticated storage management tools.

But at the PC LAN level — the environment of choice for the National Security Council and tax processor Computer Language Research — highly functional storage management tools are just now becoming a common feature.

"The model most people are following is distributed backup and centralized management," said Dan Friedlander, a storage analyst in Boulder, Colo.

For instance, a department might consolidate backup on three servers rather than put tape devices on all its machines. If that software could send alerts, alarms and reports to a central console, "you can really cut [storage] management costs substantially," said Michael Peterson, an analyst at Peripheral Strategies in Santa Barbara, Calif.

And if the software could send alerts to a network management system such as Hewlett-Packard Co.'s OpenView, so much the better, users said.

Both capabilities are slowly becoming reality among PC LAN backup software providers. Intel Corp. was the first to promote the centralized management/decentralized backup model with its Storage Express server. Now, Cheyenne Software, Inc., Emerald Corp., Legato Corp., Symantec Corp. and Tecmar, Inc. all sell some level of management tools.

Arcada Software, Inc. also recently upgraded its Storage Exec for Microsoft Corp.'s Windows NT. And although it will not ship until January, Palindrome Corp. has introduced Milan, which will serve as an umbrella for its Backup Director and Network Archivist software.

Good but not perfect

This software is a good start, users said. Certain features "exceed what we had with mainframes," said Larry Lamay, a network engineer at Computer Language Research, which processes taxes for large corporations.

For instance, many packages send alerts via electronic mail or pagers to notify administrators if a backup process did not run. However, key pieces are still missing, Lamay said. For instance, there is little multiplatform support, he said.

"What I'm looking for is a backup strategy that allows me to manage Unix, Novell, OS/2 and NT," Lamay said. He said he would like to back up each platform with native software and manage all the platforms from a central console.

Today, however, he uses SQL Backtrack for his Sybase, Inc. databases, some Unix utilities for his Sun Microsystems, Inc. Solaris machines and Palindrome for Novell, Inc.'s NetWare. The OS/2 data is backed up by Palindrome but through a NetWare server.

Automation is another concern for some users. Storage Exec "still requires much more intervention than I would like," said Carl Parramore, senior systems manager in the systems and technical planning group at the National Security Council.

The council used to run on Digital Equipment Corp. VAXs. Now, Parramore backs up 20G to 30G bytes of sensitive data per week on a dozen or so Compaq Computer Corp. ProLiant servers running NT.

In VMS, new tapes were mounted once a week for batch jobs and every month or two for incremental backups. With Arcada's Storage Exec, "we check it every day," he said.

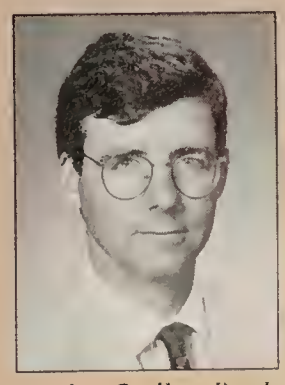
Real backup control will occur when it can be managed from a different kind of central administrator — an in-place network management system, users said.

Most of the backup vendors are working to incorporate Simple Network Management Protocol capabilities into their upcoming versions. For instance, Palindrome's Milan will reportedly be accessible from Novell's NetWare Management System.

Bank of Boston trades up

Prudential Securities is not the only financial services giant with a spanking-new $25 million trading floor. Bank of Boston Corp. is completing the rollout of a 140-seat Sun Microsystems-based trading-floor environment for its treasury group in Boston.

Bank of Boston's new trading floor is designed to support its foreign exchange and investments divisions, which account for a combined $100 billion in annual transactions. Like Prudential, Bank of Boston also relies substantially on in-house developed systems, such as the derivatives processing system the bank developed using C++ and object-oriented programming tools from Sybase, Inc.



Stephen Scullen, *Bank of Boston's treasury systems director, says productivity will increase*

The new systems should provide Bank of Boston with both productivity and financial benefits. For example, its former trading floors comprised a mix of PCs that had been connected to IBM mainframes, an IBM AS/400 and Digital Equipment Corp. VAX minicomputers — a setup that was "oriented more toward a back-office accounting mentality," said Stephen Scullen, director of treasury systems for the $44.3 billion (in assets) bank.

In addition to cost savings that will be associated with the retirement of its AS/400 and VAXs next year, Bank of Boston expects to reduce its market data expenses by 20% annually after consolidating its market data feeds to Dow Jones & Co., Standard & Poor's and a handful of other services.

Bank of Boston is also evaluating Asynchronous Transfer Mode and Fiber Distributed Data Interface high-speed networking technologies as it seeks to expand its bandwidth capabilities to support videoconferencing between traders in Brazil and Boston. Scullen said the bank expects to decide on a videoconferencing vendor by mid-1995. — *Thomas Hoffman*

Prudential

CONTINUED FROM PAGE 69

bonds department. The Windows-based system "is user-friendly, and that's good because we're not exactly computer wizards," Bennett said of staffers in Prudential's municipal bonds department.

As part of its PowerPC drive, Prudential said it plans to evaluate the price/performance advantage of IBM's Enterprise Transaction Processor next year to determine a possible fit between the parallel processing system and the company's two existing IBM ES/9000 Model 962 mainframes.

Prudential's trading-floor project is nearly complete. In early October, the brokerage rolled out IBM RS/6000 workstations to 110 traders and support staffers in the municipal bonds department. This was followed by the installation of 70 workstations to support futures. In December, Prudential will outfit 250 fixed-income traders with workstations, completing the rollout of some 700 RISC workstations and 1,000 PCs in a little more than two months.

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Sun plugs SPARCstation upgrade gap

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. last week announced a RISC processor upgrade for its SPARCstation 20 workstation. The 6-month-old workstation will be outfitted with a 100-MHz HyperSPARC chip from Ross Technology, Inc., a subsidiary of longtime Sun semiconductor partner Fujitsu Ltd.

The SPARCstation 20 Model HS11 will be aimed at technical users who have electrical circuit design and financial modeling applications that require large data sets, Sun officials said. The HyperSPARC chip — and improved cache management — can boost overall performance of a SPARCstation 20 system by 20% to 40%, Sun said.

Bruce Jenkins, a vice president at Daratech, Inc. in Cambridge, Mass., said the HyperSPARC addition is being played as an upgrade path that preserves users' investment in SPARC chip technology.

A Model HS11 with 32M bytes of memory, 1G byte of storage and a 17-in. color monitor costs $18,695 and is set to ship next month. Installed SPARCstation 20s and older SPARCstation 10s, which use SuperSPARC 50- and 60-MHz chips, can be upgraded with a board kit.

Sun also said it is shipping a modified version of the SunOS operating system, called Solaris 1.1.2, to support use of the HyperSPARC microprocessor. However, Solaris 1.1.2 can run on any Sun workstation, allowing users to maintain one version of the older Solaris 1.x system on multiple machines.

Industry analysts said the HyperSPARC upgrade is a stop-gap measure for users who are waiting to install 75- and 90-MHz versions of the SuperSPARC chip family. According to Sun's published microprocessor road map, the 75-MHz SuperSPARC II chip was due to arrive by year's end. Users are also waiting for the 64-bit UltraSPARC chip, which is to reach sample quantities by January.

Even when faster SuperSPARC II chips arrive, they may be surpassed by other RISC microprocessors.

"They're not going to the head of the class on processor performance," said Jeffry Canin, an analyst at Salomon Brothers, Inc. in San Francisco. "It's merely that the gap is going to narrow." The new SuperSPARC chips could boost performance by 50% or more, he said.

Briefs

HP, SGI blend products

Hewlett-Packard Co. said it has reached an agreement with **Silicon Graphics, Inc.** (SGI) to port HP's mechanical computer-aided design (MCAD) software to SGI's Irix Unix workstations. The MCAD packages address two-dimensional design, drafting applications and documentation of technical products. They have already been ported to Unix workstations from Sun Microsystems, Inc. and IBM.

SGI eases Web access

SGI said it is developing an icon-based user interface to work with on-line search-and-retrieval software from **Fulcrum Technologies, Inc.** in Ottawa. The interface would ease access to SGI's Silicon Surf World-Wide Web Internet server.

HP simplifies openness

HP said last month it has improved its HP NetServer Assistant and HP Remote Assistant network management software products with ease-of-use features for the installation and configuration of open systems networks.

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New Products

Tech-Source, Inc. has announced the Gxtra/1 Turbo, a graphics accelerator.

According to the Altamonte Springs, Fla., company, the Gxtra/1 Turbo operates at 50 MHz and can be used as a graphics accelerator or to support multiple graphics users on Sun Microsystems, Inc. SPARCstations and compatible workstations.

The Gxtra/1 Turbo costs $1,195.

▶ *Tech-Source*
(407) 830-8301

Medialogic ADL, Inc. has announced SLA-4base, SLA-4plus and SLA-4max, 4mm digital audiotape libraries.

According to the Boulder, Colo., firm, the libraries provide data interchange among 4mm tapes stored in the library and other tape technologies, including 8mm, quarter-inch cartridges, CD-ROM and rewriteable optical disc cartridges.

All libraries are field-upgradable, with a fault-tolerant feature and hot-swap capability.

Prices start at $7,845.

▶ *Medialogic ADL*
(303) 939-9780

Cambridge Quality Management, Inc. has announced Performance Tracker, a decision-support tool for visualizing performance.

According to the San Francisco firm, Performance Tracker is an interactive graphical tool that uses familiar business concepts so that any user can configure the tool to develop queries and reports.

Users can import existing manufacturing, sales, shipping or financial data and enter simple models and performance targets to describe the business process. The product highlights problems and drills down to the root cause.

Performance Tracker costs $20,000.

▶ *Cambridge Quality Management*
(415) 750-1327

Digital Equipment Corp. has announced the DEClaser 3500, a workgroup laser printer.

According to the Maynard, Mass., company, the DEClaser 3500 prints 12 page/min. and lets users fax and receive Adobe Systems, Inc. PostScript documents from the printer both domestically and internationally.

The DEClaser 3500 was designed for small to medium-size workgroups, includes 600 dot/in. resolution and can connect to multiple PCs, Macintoshes or office networks simultaneously.

The DEClaser 3500 costs $2,099 for the Macintosh model and $2,199 for the network model.

▶ *Digital*
(508) 493-5111

Eastman Kodak Co. has announced Kodak Imagelink request processor, a PC-based image retrieval subsystem.

According to the Rochester, N.Y., company, Kodak Imagelink delivers document images to the user in the required format: either a hard copy or an electronic file.

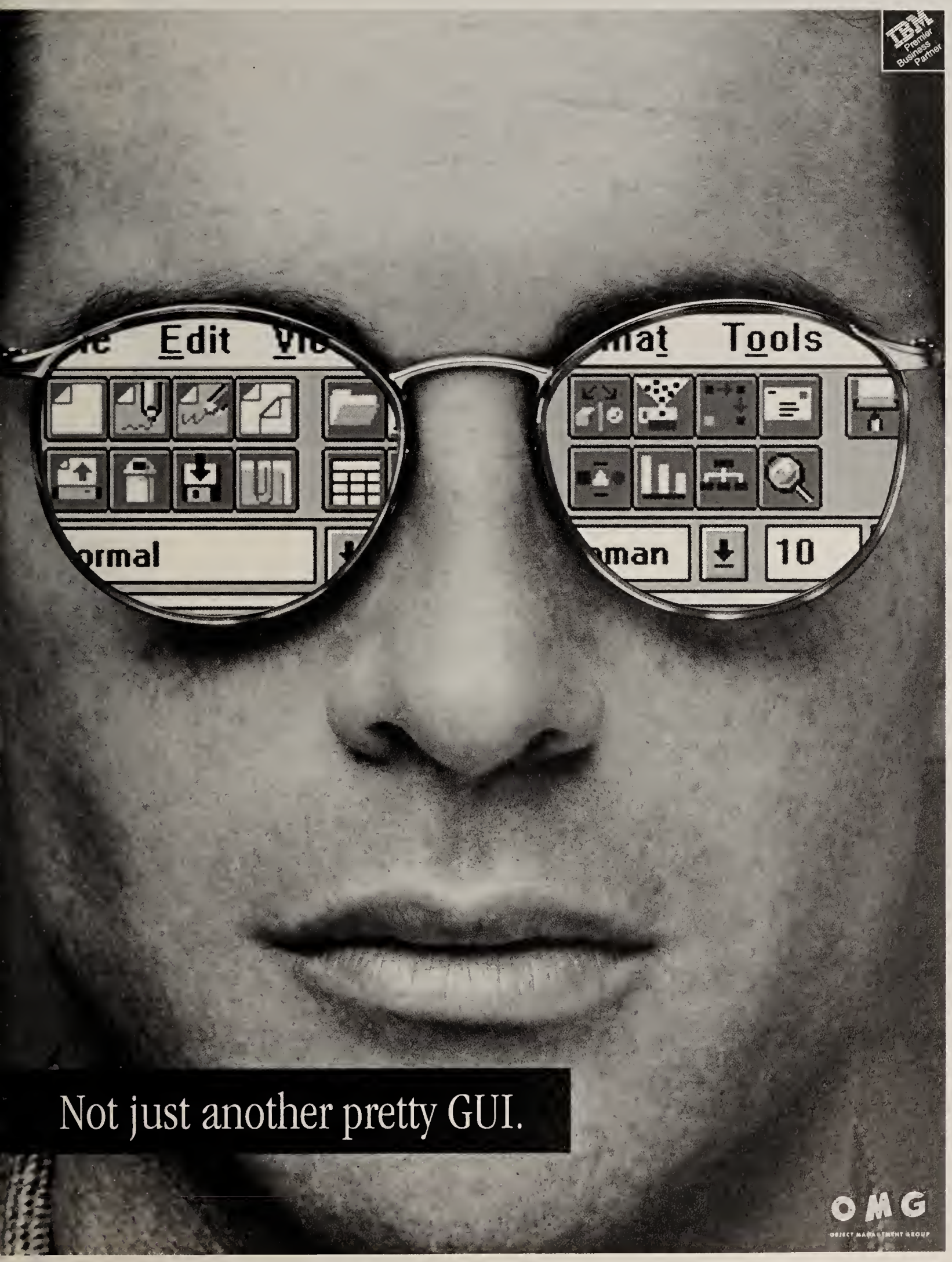
The product can be integrated into any film or electronic index management system that can provide retrieval requests in a standard format known as tagged file interface.

Kodak Imagelink costs $10,000.

▶ *Eastman Kodak*
(716) 724-4000

Product short

Kingston Technology Corp. has announced Sun Microsystems, Inc. SPARCserver upgrade kits, 32M-, 64M-, 128M- and 256M-byte upgrade configurations for SPARCserver systems. Cost: from $1,495 to $14,500. Kingston Technology, Fountain Valley, Calif. (714) 435-2667.



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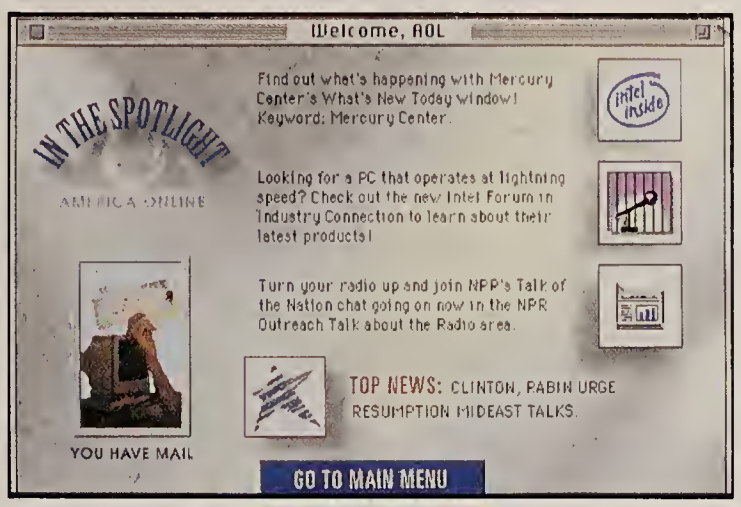
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On-line services fight for corporate users

By Suruchi Mohan

America Online, Inc.'s recent announcement that it is offering a multimedia interface in a software upgrade is the latest attempt by an on-line service provider to attract and retain corporate end users.

America Online's multimedia interface enhances its graphical user interface with more visual appeal, and it offers navigational features. For example, each category screen has three new buttons to give users more choices, according to a spokeswoman for America Online in Vienna, Va.



America Online *has beefed up its user interface as the nature of on-line services becomes increasingly competitive*

Attention-getter

America Online is not alone in dressing up the front end; all on-line service providers are jumping on this bandwagon. "All the appeal is in the front end," said Gene DeRose, president of Jupiter Communications Co., a research and publishing company in New York. "They are putting incredible amounts of power and design" into the interface to try to attract users, he added.

> "When E-mail becomes as ubiquitous as the answering machine, we will see more popularity in on-line services."
> — Gene DeRose, Jupiter Communications

Because on-line companies are faced not only with attracting new users but with retaining the ones they have, graphical appeal is not their only focus. Improving content is equally important. To that end, America Online has increased its number of categories from

On-line services, *page 81*

Commentary

E. Ted Prince

Mobile complexities



Is it so obvious that we'll all be telecommuting to work in the next year or so? Are we sure that we'll be on the road with our personal digital assistants and cellular modems exchanging information across the world like we're in the same room? I don't think so.

Mobile computing is a brilliant theory, but right now it is largely just theory. It has promise, but we're not seeing much of it and probably won't for some time.

A lot of the mobile computing paraphernalia is a mess to work with. Have you ever tried to set up your network or on-line service and had to fool around with the modem strings? Or connect your computer to your hotel telephone (with or without a digital converter)? Argued with your fax software when it decides to get ornery? Did you bring the software manuals with you on your business trip?

And what about carrying around your "mobile" workstation? Think in terms of 7 pounds, unless you are prepared to do without the floppy, cables, converters and couplers. If you're interested in the new laptops with color screens and CD-ROMs, remember they are not only heavier but also very expensive. How mobile does this sound to you?

If you want to log on to your favorite on-line service, you'll need all the phone numbers with you for all the cities you plan to visit. Your software is unlikely to help you. If you have a problem logging on, how many calls will it take before you can contact the vendor's help person?

Some say the new wireless revolution is going to help things, but I can't imagine it right now. To all the above issues add new interoperability issues, reception, security, even comprehensibility. Do I go cellular, personal communications services, radio, one-way, two-way, pager, etc.? How about friendly viruses flying through the sky and corrupting my hard disk or the lawn mower next door fouling up my data reception?

Tough commute

So how does a reasonable person telecommute? With great difficulty. Sometimes it will work like a dream. Sometimes it will destroy your business trip or force you back to the old office where you have some technical support and a backup machine, not to mention the manuals.

Mobile computing was designed by stationary people in a stationary world with a stationary worldview. It was a static mainframe-centered universe. Standards were set by the Holy Roman IBM. Everyone spoke Cobol. There were no entrepreneurs inventing crazy new things we would have to learn about.

Mobile computing is the Copernican revolution in a mainframe-centered world. No one ever said that with PCs the world would become relative, that multiple new standards would emerge or that we'd be in different places every night, with different services, different telephone networks and different modems. We're just now finding all this stuff out.

Don't expect things to improve overnight. The mobile revolution has only just begun, and we're going to have a lot of pain before it's over.

Prince is president of Perth Ventures, Inc., a technology deal-making, publishing and consulting firm in Hawley, Pa. He can be reached by CompuServe at 74073,1236.

ATM moves to PCs, Macs

By Stephen P. Klett Jr.

Asynchronous Transfer Mode (ATM) is not just for high-end graphics workstations anymore. Fore Systems, Inc. recently unveiled a suite of products designed to bring ATM to the PC desktop.

For users looking at implementing ATM in the next year or so, the availability of more adapter cards for platforms other than high-end Unix workstations is good news.



"We're looking at ATM for perhaps late 1995, and it looks like the products needed to support it will be there before we are, which is good news," said Jerry Magginnis, vice president of telecommunications at McCann-Erickson Worldwide, an advertising agency in New York.

Jerry Wybel, MIS network manager at Foxwoods Casino in Ledyard, Conn., agreed. "It's hard to get Ethernet or fiber network interface cards today, let alone ATM," he said.

Onward and upward

Last year, Fore Systems shipped 2,200 ATM adapters. It shipped 1,400 in the second quarter of this year and projects total shipments of roughly 9,000 units for 1994.

The lineup

Pittsburgh-based Fore is now shipping ATM adapter cards for Extended Industry Standard Architecture-based PCs and the Macintosh. The cards are called the ESA-200PC and NBA-200 Nubus adapters, respectively. Fore plans to ship the PCA-200, a Peripheral Component Interconnect adapter, in the first quarter of next year.

The cards, which start at $1,595 and $1,895, respectively, include an embedded Intel Corp. 1960 processor and ship with ForeThought LAN Emulation 0.4, the first release of Fore's ATM connection management software. They are available in both 100M and 155M bit/sec. versions.

ForeThought 0.4 is based on the emerging ATM Forum standard for LAN emulation. Fore plans to ship Version 1.0 by the end of next year. It will be fully compliant with the completed ATM Forum standard, according to George Prodan, director of marketing at Fore. Prodan said ForeThought 1.0 will be backward compatible with Version 0.4.

In addition to the cards, Fore unveiled PC and Macintosh driver software, including versions for Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT and Windows for Workgroups and Apple Computer, Inc.'s MacTCP and AppleTalk.

Price barrier

However, while ATM products become more widely available, cost remains a stumbling block. Magginnis and other users said ATM prices still need to come down to about $1,000 per connection before they will implement it. Fore estimated the cost per desktop connection using its equipment today is roughly $3,000. Prodan said prices would hit the $1,000 target by the end of next year.

In terms of network management, Fore offers a Simple Network Management Protocol-based application called ForeView for Hewlett-Packard Co.'s OpenView, Sun Microsystems, Inc.'s SunNet Manager and IBM's NetView/6000. It plans to ship a stand-alone version of ForeView for Windows NT in the second quarter of next year.

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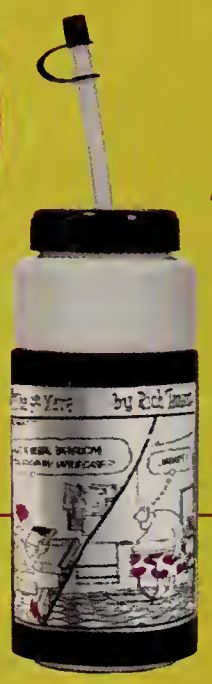


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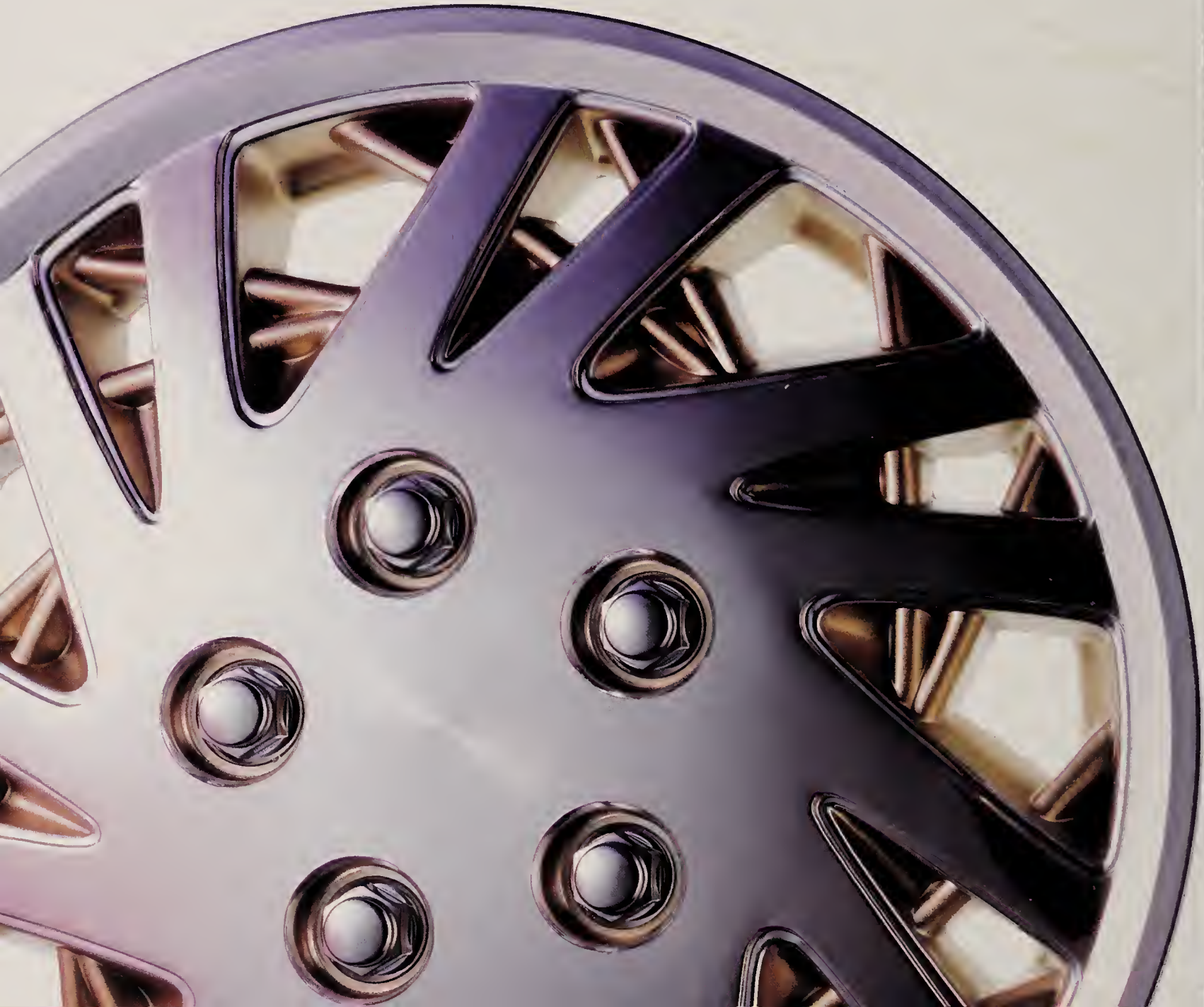
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New from IBM: Intelligent Ethernet and Token-Ring hubs.

Given the explosive growth in networking, it's no surprise that LAN administrators need help managing their environments.

IBM introduces three outstanding new helpers: the IBM 8224 Ethernet Stackable Hub and the IBM 8230 Token-Ring Controlled Access Unit (Models 3 and 13).

These intelligent hubs bring cost-effective, centralized management to the smallest workgroups. And their modular design allows them to grow as you grow. All models support SNMP network devices, so you can monitor and control remote workgroups from a single workstation with programs such as NetView®/6000.

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8224 Ethernet Stackable Hub

The new IBM 8224 is a premier remote site and workgroup Ethernet hub with stackable units of 16 10BaseT ports each, plus an optional media expansion port that can connect to an existing 10Base2, 10Base5, or fiber Ethernet network.

An 8224 Model 1 is an unmanaged (yet manageable) unit that can be stacked up to ten together in a standard rack or on a desktop. Model 2, with an SNMP agent, can manage a stack of nine Model 1s, to provide a total of 170 ports. And, unlike most competitive hubs, stacked units can be separated by as much as 250 feet. The 8224 also accommodates LAN growth with cascading through the media expansion port. To alleviate congestion, you can also segment an 8224 stack to isolate bandwidth-hungry servers and workstations.

The 8224 supports out-of-band management of a remote site via SLIP protocols. It supports SNMP MIB II, the hub repeater MIB, and the Novell® Repeater MIB, with management by DOS or AIX® applications, and SNMP over IP and IPX for management in a TCP/IP network and Novell NetWare® Management Station. For mission-critical applications, a second Model 2 can provide management redundancy.



8222 6-Port 10BaseT Workgroup Hub

Now you can add an entire workgroup to your LAN without rewiring. Ready to concentrate inexpensive, twisted-pair wiring, the IBM 8222 allows you to link as many as seven PS/2® or PS/ValuePoint™ computers or compatibles to a new Ethernet 10BaseT LAN. Six additional computers can be linked with each 8222 cascaded through either AUI or 10BaseT ports.

In addition, the 8222 hub automatically disables (partitions) any port connected to a station causing repeated collisions, then re-enables the port when the condition clears.

orkgroups of all sizes.





8230 Token-Ring Controlled Access Unit (Models 3 & 13)

The new IBM 8230 Token-Ring Controlled Aecess Unit (Models 3 and 13) brings intelligent manageability to small workgroups at a very eompetitive priee per port. These newest members of the IBM 8230 family of intelligent eoneentrators also offer granularity and modularity that make them remarkably versatile and expandable units.

A new 8230 ean perform as an affordable, entry-level workgroup eoncentrator for just a handful of deviees or as a eompletely managed, full-funetion, 80-node hub with dual ring redundaney. You ean eonfigure it with 2-, 3-, or 4-port Lobe Insertion Units (LIUs) that plug easily into the base unit for more port eapaeity as needed. Also available are 20-port Lobe Attaehment Modules (LAMs) and remote 16-port LAMs for linking network deviees a full 200 meters from the base unit.

With a new 8230, you ean manage your Token-Ring LAN via LAN Network Manager, or an SNMP manager sueh as NetView/6000. Enhanced error and status displays help you identify problems fast. And for LANs requiring extra reliability, an optional dual ring redundaney feature is available for use with Ring-In/Ring-Out modules.



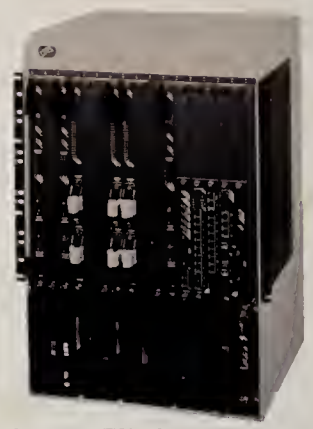
8228 Multistation Access Unit

The IBM 8228 is a reliable, eost-effeetive hub for quiekly and easily eonneeting up to eight deviees to a 16 or 4Mbps Token-Ring network. This passive unit is ideal for intereonneeting with other hubs to ereate larger networks using IBM Cabling System (ICS) eonneetors.

It takes up very little real estate and ean be located in a wiring eloset, on a desktop, on a wall, or in a standard 19-ineh raek. The 8228 offers Ring-In/Ring-Out (RI/RO) ports for added flexibility. It also supports STP and UTP eabling.

High





8260 Multiprotocol Intelligent Switching Hub

The new IBM 8260 "super hub" is the platform for the next generation of high-speed networks. It provides for easy migration to asynchronous transfer mode (ATM), multimedia LANs and other technologies that require very high bandwidth.

The 8260 chassis accepts all media and interconnect modules from an IBM 8250, so it will protect your existing network assets.

With an advanced passive backplane architecture extending that of the 8250, the new 8260 manages multiple segments concurrently. This very high density system can handle up to eight Ethernet, 17 Token-Ring or eight FDDI networks in a single 17-slot, fully managed hub.

Beyond its leading edge, ATM-ready design, the 8260 introduces the Intelligent Power System, with as many as four power supplies, that dynamically distributes the load evenly among all sources. The 8260 also introduces a new Distributed Management Architecture, enabling concurrent management of multiple LAN segments.



8235 Dial-In Access to LANs Server

Extending enterprise network resources to mobile computer users is now easier than ever. With the IBM 8235 Dial-In Access to LANs Server (DIALS), remote users can have full, transparent access to all your network services from any location that has dial-up phone service.

The 8235 DIALS is a high-performance, multiprotocol, multiport remote networking server that provides full-function Token-Ring or Ethernet connections. It supports protocols widely used in NetBIOS, NetWare, 3270 SNA, and TCP/IP.

performance choices that fit expanding networks.



8250 Multiprotocol Intelligent Hub

The advanced IBM 8250 is versatile enough to protect your current LAN investment and serve as the cornerstone of your network for the future. An 8250 lets you create and connect LANs, change configurations, switch users and perform other tasks without major rewiring.

Build the 8250 system that fits your environment with your choice of more than 50 modules (concentration, interconnection and management), plus powerful management via NetView/6000.

The 8250 simultaneously supports Token-Ring, Ethernet and FDDI topologies over a wide variety of media. For future upgrades or changes, just add new "hot-pluggable" modules to your existing hub.

Management options include centralized or distributed, out-of-band locally or remote, in-band through SNMP, and remote log-on via TELNET from a TCP/IP station.

8250s also include fault-tolerant features and redundancy to keep client/server LANs in mission-critical applications up and running in the event of problems or hardware failure.



8271 EtherStreamer Switch

Is your Ethernet LAN getting clogged? The IBM 8271 EtherStreamer™ Switch can boost network performance at a very low cost per port. This high-performance, standalone device interconnects as many as eight 10BaseT Ethernet LAN segments or a single node, transports traffic at full media speed, and extends network bandwidth from 4 to 8 times that of a single Ethernet segment. When coupled with our full-duplex EtherStreamer adapters, you can now offer 20Mbps Ethernet performance for an individual workstation or a server.





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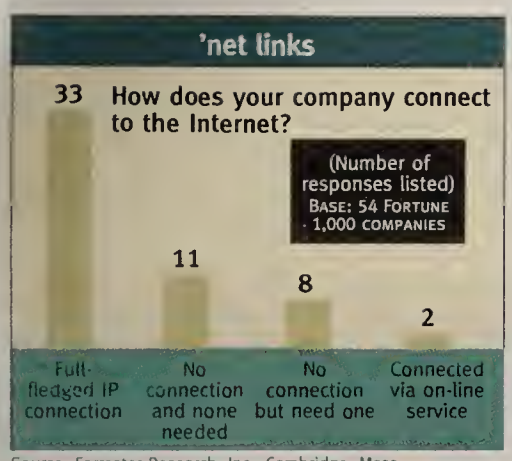
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Get with the Internet, folks

By Gary H. Anthes

Corporate end users are clamoring for access to the Internet, but information systems managers are holding back, afraid the 'net will offer up security problems, unreliable performance and flaky software.

Those are among the conclusions of a Forrester Research, Inc. report based on interviews with IS managers at 54 Fortune 1,000 firms. The report, "Internet Adolescence," recommends that IS managers overcome their fears and start connecting corporate systems to the global network of networks. "Users will do it if you do not," the company warned.



Source: Forrester Research, Inc., Cambridge, Mass.

Moreover, IS managers will be better for the experience, the Cambridge, Mass., consulting firm advised. "IS managers must experience the inner workings for themselves in order to germinate and assess new business ideas," the report said.

Upper management

Barry Wessler, chief executive officer at Plexsys International Corp. in Herndon, Va., said the tension over Internet use is not simply between users and IS managers. "The tension is with the management of the corporation," he said. "It's over the marginal utility of the time spent on the Internet. The IS guy may have gotten a bum rap because it may have been a management decision to minimize [access] to the Internet."

Despite external perils and internal politics, Wessler said companies should connect to the Internet. "There is no doubt that the educated population will have a need for the Internet," he said. "There is information they are hungering for, and to deny them that is inappropriate."

Forrester pointed out that government funding for the major Internet backbone, NSFnet, will end next year, but it said ultimately that will be good news for corporate Internet users.

"To avoid a meltdown when the money dries up, large national Internet providers ... are inking agreements to carry each others' traffic," said Jay Batson, a senior analyst at Forrester Research. "However, these deals, plus the evaporating government subsidy, are effectively squeezing the regional Internet access providers out of the game. And the Internet will be better off as a result."

Paying for it

"That will tend to transition people to the higher quality and, yes, somewhat premium-priced providers," said Ben Barker, senior vice president and chief technology officer at Bolt Beranek and Newman, Inc. (BBN) in Cambridge, Mass. "The regionals are an artifact of the [National Science Foundation] policy that started all this. They make no sense today. Companies want providers that can offer nationwide and worldwide connectivity."

BBN owns and operates two of the regional networks, Nearnet and Barrnet. Barker said BBN will become a nationwide Internet access provider in the next few years through acquisitions and network development.

Catch the wave

A recent Forrester Research report said the following developments will help boost Internet use "out of its current techie state and into the business mainstream":

▶ **Internet-ready LAN applications.** Major vendors such as Lotus Development Corp. and Microsoft Corp. are adding IP support and beefed-up security to their network products.

▶ **TCP/IP on every desk.** Microsoft's next Windows release will be TCP/IP-enabled, "making every PC Internet-adept out of the box."

▶ **A breakthrough in Internet surfing.** Tools such as Mosaic and World-Wide Web will facilitate trolling the 'net by network nonwizards.

On-line market

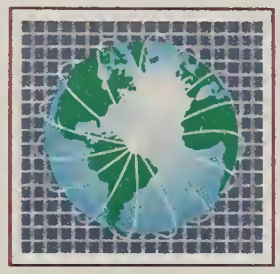
Prodigy hopes to reach Internet's 'millions' with mixture of services

By Ellis Booker

How will existing commercial information network providers play on the Internet?

Two weeks ago, Prodigy Services Co. in White Plains, N.Y., offered one model: an independent service offering a mix of free and paid services.

Prodigy's World-Wide Web AstraNet service, launched Nov. 1, is the boldest attempt yet by a commercial information network company to participate in the frenetic Internet market, observers said.



CompuServe, Inc. in Columbus, Ohio, and America Online, Inc. in Vienna, Va., have likewise outlined strategies to allow their subscribers to make use of Internet-based services. Currently, all three services provide access to the Internet's Usenet news groups and have for years allowed the exchange of mail between the Internet.

"If anything, [commercial providers such as Prodigy] have the potential to take a lead on the Internet," said Larry Krumenaker, an on-line consumer services watcher in Hillsdale, N.J. These services are well known and organized, and they have experience organizing and simplifying users' access to on-line resources, he said.

On-line manager

Prodigy also announced the creation of an Internet Services unit that will manage the content and services on AstraNet, including a variety of for-pay news and information resources. AstraNet's specific for-pay services will be unveiled next month; pricing has yet to be announced.

Regarding the paid services, Prodigy officials said they will not yet rely on credit-card transactions across the Internet.

"We're fans of a secure Internet ... but we didn't want to wait for a secure Mosaic before coming up with a service and content," said a company official. Users will instead call a Prodigy telephone number, provide credit-card information and establish an account for the paid AstraNet services.

"Are they in danger of cannibalizing their core service? I don't think so," said Daniel Dern, an Internet analyst in Newton, Mass.

Rather, Dern said, Prodigy and others are going after a new and much larger market. Whereas the largest commercial data network company has fewer than 3 million subscribers, the Internet population is estimated at between 25 million and 30 million users worldwide.

"The hardest challenge on the Internet today is attracting people and making them repeat customers," said Dern, noting that Prodigy's plan to offer a mix of free and paid services seems to be the model that many fee-based providers are using to encourage what he called "foot traffic" on their server's home page.

Room for everyone

Meanwhile, most analysts say that even in the shadow of the Internet, a plethora of on-line services will continue to exist because each has different user populations and strengths.

As part of its AstraNet announcement, Prodigy said the next generation of its user interface software will include a graphical Internet browser. This software, due next year, will let subscribers on Prodigy's core service access Prodigy and AstraNet resources.

Ultimately, Prodigy officials said, resources on the core service and AstraNet will be transparent to users. They noted that most of the content in Prodigy's core service is already coded in HTML, the hypertext markup language that is the basis of the hyperlinks between Internet pages.

"We'll create the content once and play it in whatever distribution [medium] is in place," said a company official.

Check it out

Users can explore Prodigy's brand-new AstraNet World-Wide Web server with any Mosaic-like graphical browser for the Internet. Reach AstraNet's home page at: http:\\www.astranet.com.

On-line services

CONTINUED FROM PAGE 79

nine to 14; they include sports and the Internet.

For its part, CompuServe has added downloadable music and created CompuServe CD, a companion to the on-line service.

CompuServe CD allows users to click on something that interests them on the CD's screen and then get more information about it by being put back into the relevant part of the on-line service. This is done through hypertext links between the CD and the on-line service, according to Regina Brady, director of customer promotion at CompuServe, Inc. in Columbus, Ohio.

Additionally, on-line service providers are giving users access to certain popular TV programs such as *Larry King Live* on CNN. CompuServe members can pose questions to King via the forum. Also, Prodigy recently signed up *The Los Angeles Times*.

As with all technologies and services, as they mature, on-line services are steadily coming down in price. For example, America Online offers its entire service for $9.95 per month for five hours. Each additional hour is $3.50. As of Jan. 1, each additional hour will be $2.95.

Although companies are working hard to attract users, business use of on-line technology is still questionable.

Bob Moskowitz, software support specialist at Chrysler Corp. in Detroit, said there is no place in large corporations for on-line services. The Internet serves the needs of most users, and only a few individuals at Chrysler subscribe to on-line services for a specific job-related task, Moskowitz said.

Modem technology pushes forward

By Michael Fitzgerald

Recent modem announcements reinforce the market's inexorable push to higher speeds, smaller form factors and more features.

Motorola, Inc.'s Transmission Products Division, a major player in the high-end corporate modem market, recently pushed into the retail arena. Motorola announced a $339 cellular PCMCIA modem, the PowerSeries, that works with both notebooks and Motorola's data-equipped cellular phones. The company also introduced the $279 Lifestyle Series modem, a more conventional PCMCIA data/fax modem. Both modems offer 14.4K bit/sec. data rates.

Modem mambo

Steady double-digit growth will mark the modem market in the next few years, according to Frost & Sullivan, Inc.

Total modem market (U.S.):
1993: $844.7 million
1994: $989.2 million*
1995: $1.15 billion*
1996: $1.33 billion*
* Projected

Some analysts saw the move as a push by Motorola to combat U.S. Robotics, Inc.'s recent purchase of Megahertz Holding Corp., the leading maker of PCMCIA modems [CW, Oct. 31].

Jay Berryhill, general manager of retail distribution at Motorola, said this was not the main motivation. "We see a strong opportunity here, and one that's only going to get larger. It's time for us to enter [this] market," Berryhill said.

As for other parts of the wireless data market, RAM Mobile Data users should get some choices thanks to Ericsson, Inc. and Rockwell, Inc. Ericsson announced the first wireless modem in a PCMCIA form factor. The modem, which costs $775, will be sold only to OEMs at first, with an end-user version available in January. The modem is meant to give mobile users a way to get wireless connectivity without carrying around today's bricklike wireless modems.

Meanwhile, Rockwell will today announce a chip set that supports the RAM Mobile Data architecture [CW, Nov. 7]. This should reduce costs and perhaps encourage more users to seriously consider the struggling network vendor, which has suffered from a lack of peripherals. For instance, only Ericsson and Motorola made modems for RAM Mobile Data users before now.

"The Rockwell chip set is a real coup for RAM [Mobile Data]," said Alan Reiter, editor of "Mobile Data Report," a newsletter in Alexandria, Va. Reiter said it was particularly good because it would give users a choice of form factors for their wireless modems, rather than forcing them to carry the external box that is all that exists today.

Working together

Meanwhile, AT&T Corp.'s proprietary v.32terbo modem technology got a boost when two smaller modem players, ATI Technologies, Inc. and Cardinal Technologies, Inc., announced new 14.4K/19.2K bit/sec. modems using an AT&T Controllerless Modem Chip Set. ATI's Vigor family starts at $89, while Cardinal's 14.4/19.2 Modem costs $99.

The influx of small companies like ATI and Cardinal underscore a general push from modem makers into the retail market, analysts said.

"The corporate modem market is saturated, and you're going to see a lot of people making a bid to be the low-end retail product leader," said Maribel Howard, analyst at International Data Corp. in Framingham, Mass.

Briefs

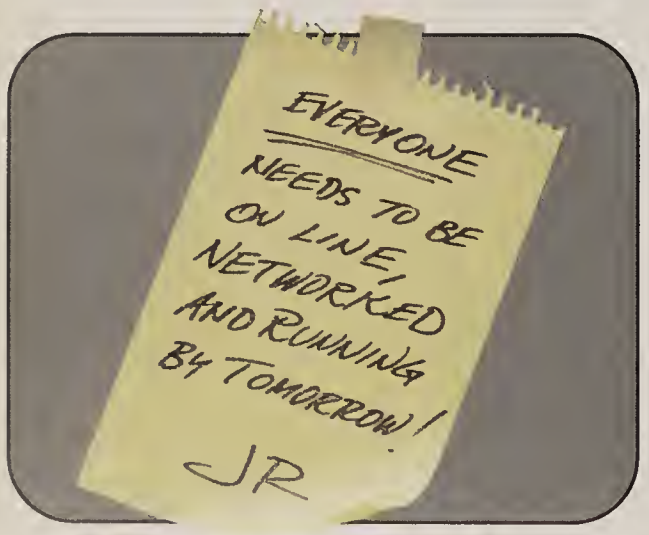
Messaging in the UK

The UK has commissioned **Digital Equipment Corp.** and **BT**'s Syntegris systems integration unit to build a message-handling service, a project that could reach $70 million to $140 million. The proposed system would link thousands of medical and dental practices and hundreds of hospitals and health authorities across the UK into one nationwide network.

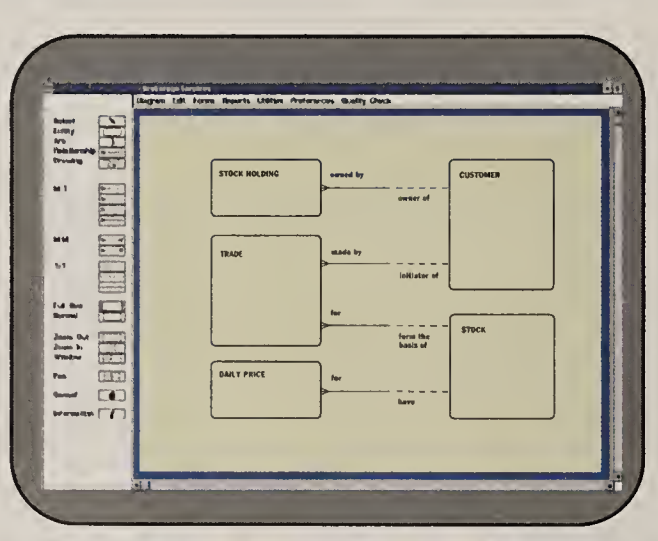
Axon, HP team up

Axon Networks, Inc. and **Hewlett-Packard Co.** announced they have codeveloped the Aspen Management Information Base (MIB) for controlling and configuring Remote Network Monitoring (Rmon) probes in networks that use the Simple Network Management Protocol. The firms have submitted Aspen MIB to the Internet Engineering Task Force for consideration as a standard Rmon MIB. Axon's LANServant Probes and HP's LanProbes interoperate as a result of their support of Aspen MIB.

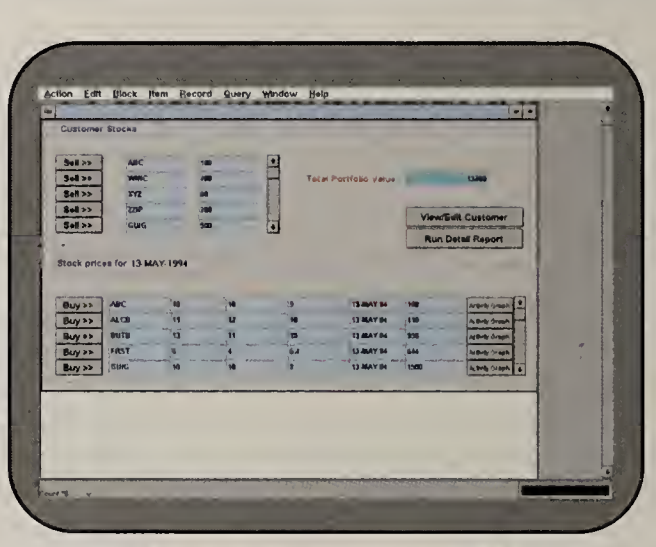
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Switch expedites E-mail

By Lynda Radosevich

Messaging vendor Isocor has introduced a new version of its Unix-based, high-volume messaging switch.

Called Isoplex Version 4, the Los Angeles firm's switch is aimed at telecommunications companies and very large corporate users who are building client/server messaging backbones as the basis for other communications services.

Isoplex includes an X.400 messaging transportation facility, an optional multimedia message-storing database and application modules for electronic mail and electronic data interchange (EDI). It is said to be faster and less expensive than its competition.

US West Communications, Inc. in Denver is looking at Isoplex as the foundation for its 17,000-customer Interact E-mail switching service. The company uses messaging switches from SoftSwitch, Inc., which was recently acquired by Lotus Development Corp.

"Heavy-duty machines typically cost up to a half-million [dollars]," said Miles Morimoto, director of messaging at US West. Isoplex servers would cost US West roughly $50,000 to $100,000 "and can run on a Pentium and pump 25 messages per second. That's a significant enhancement in price/performance," he said. Morimoto added that the integrated EDI option is attractive, too.

Mike Rothman, an analyst at Meta Group, Inc. in Reston, Va., said Isoplex runs faster than competitive products from SoftSwitch, Control Data Systems, Inc. and Infonet Solutions, Inc. "If you need to get a lot of messages through in a large environment, [Isocor] has the most scalable backbone solution now," Rothman said.

Extra support

Because Isocor's Isoplex server supports E-mail standards such as Microsoft Corp.'s Messaging Application Programming Interface, it can be used with third-party E-mail clients such as Microsoft Mail.

AnyNet aims for any protocol

By Suruchi Mohan

IBM has added two new protocols to its OS/2-based AnyNet gateway family.

Based on the Multiprotocol Transport Networking architecture, AnyNet software allows any application to communicate with any other, regardless of the networking protocol used (see chart).

The new protocols include AnyNet IPX over SNA gateway for OS/2 and AnyNet SNA over TCP/IP gateway for OS/2.

Charles Hights, a senior systems analyst at Pacific Bell in San Ramon, Calif., has been using AnyNet on an MVS platform. The Pac Bell network is, for the most part, TCP/IP, with lots of SNA applications. AnyNet allows the SNA applications to communicate with one another over the TCP/IP network, Hights said.

"The end applications don't have to change," Hights said. Having a gateway handle all the translations among applications saves time and money, he added.

This is a significant announcement because there is a "60% overlap between the IPX and SNA customer base," said Anura Guruge, an independent consultant in New Ipswich, N.H. "IBM is paving the way for AnyNet to be a multiprotocol router."

Mark Pozefsky, IBM's AnyNet product manager in Raleigh, N.C., said there have been discussions about merging AnyNet functionality with IBM's 6611 multiprotocol router, but nothing has been decided yet.

However, Guruge said AnyNet will provide an alternative to the 6611, and the new announcements are just a step along the path. An alternative to the 6611 is important because the 6611 is merely a "me, too" bridge router that IBM manufactured to keep up with the multiprotocol router Joneses, Guruge said.

Audrey Apfel, a research director at Gartner Group, Inc. in Westport, Conn., said AnyNet will serve only a niche market. "I don't see a widespread use of the [gateway] technology. It is not going to change multiprotocol networking."

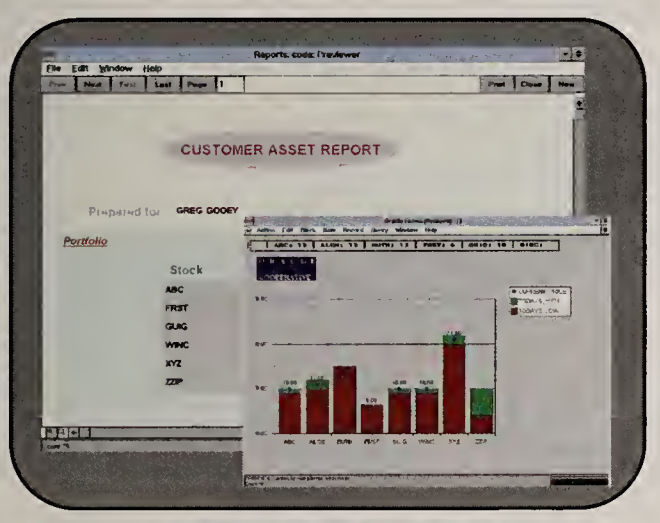
What is it?

AnyNet is software that allows two applications to talk to each other, regardless of which networking transport they use. This software runs in access node or gateway products that can handle multiple protocols.

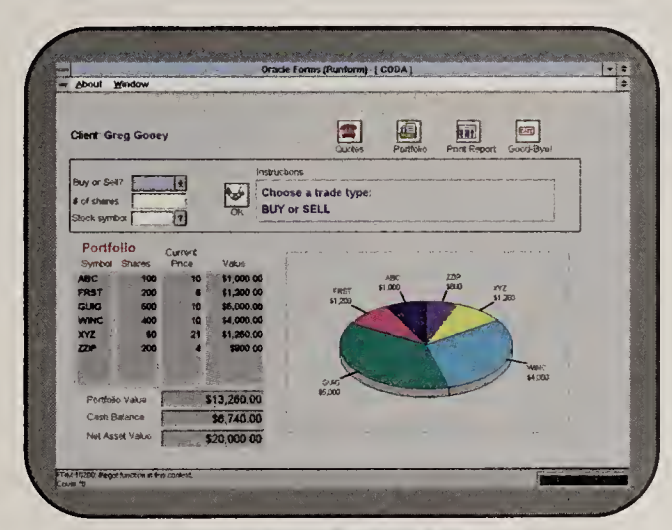
For example — SNA applications can run over a TCP/IP network using an AnyNet gateway. Also, two SNA networks can communicate with each other using an SNA-over-TCP/IP gateway.

The AnyNet family is based on the Multiprotocol Transport Networking architecture. The architecture was submitted three years ago to X/Open Co. and was only recently approved and published as a standard.

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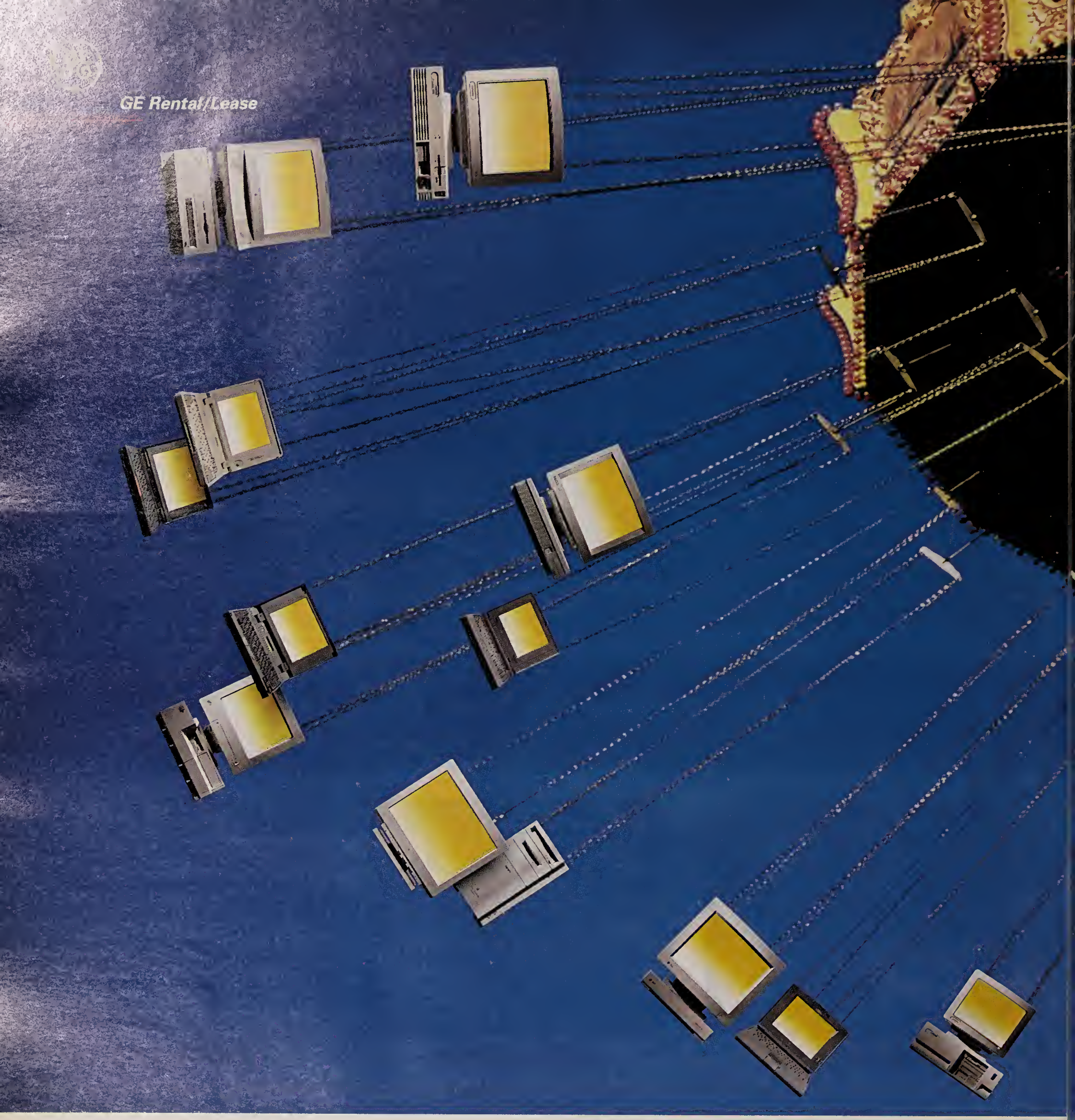


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Managers of distributed nets gain control

By Steve Moore

New products unveiled recently by Concord Communications, Inc. and UB Networks, Inc. will help automate Simple Network Management Protocol (SNMP) network management tasks and minimize administrative workloads.

Analysts said UB's distributed Access/Empower Supervisor and Concord's more centralized Network Health and Universal Poller modules for its Trakker network management system could play complementary roles in some multivendor networks.



Concord is more focused on monitoring collection points and, with its centralized database, processes the information collected, according to Rick Villars, an analyst at International Data Corp. in Framingham, Mass. Universal Poller extracts data from hubs and Remote Network Monitoring (Rmon) agents and delivers it to Network Health and other centralized Trakker applications for analysis.

In contrast, "Access/Empower is designed to put processing horsepower as close to the management event as possible," said John McConnell, president of McConnell Consulting Co. in Boulder, Colo. Because it runs in each hub, Access/Empower can take action in real time to reconfigure the hub or turn ports off, he said.

"A lot of users would likely use both products," McConnell said. Access/Empower could be used where UB hubs are in place, he said, while Concord's Universal Poller could be used where Bay Networks, Inc. or Cabletron Systems, Inc. hubs are present. Both UB and Concord said they plan to broaden their products to work with other vendors' LAN hubs.

"Our guys really like Network Health because it gives us good profiles of how a particular LAN segment in a building is acting or how our backbone is acting," said Joe Askins, director of data communications at Arizona State University in Tempe.

Concord's new applications "will help us leverage our limited staff, which is what we've been trying to do with Trakker all along," Askins said. Forexample, the Universal Poller's exception reports eliminate the need to continuously monitor the network, he said.

The fact that both vendors' products support trend analysis illustrates that "everybody is moving away from simply looking at problem management" and toward management based on policies defined by the customer, McConnell said.

Villars said both vendors still need to allow users to automatically correlate events that occur in different parts of their networks. This will allow users to respond faster to complex problems such as broadcast storms, he said.

UB Networks

- **Access/Empower Supervisor**

What it is: New hardware and software module for Access/One hubs
What it does: Distributes SNMP management functions to individual hubs
Benefit: Increases network uptime and localizes SNMP traffic
Price: $5,995 to $7,995
Availability: December

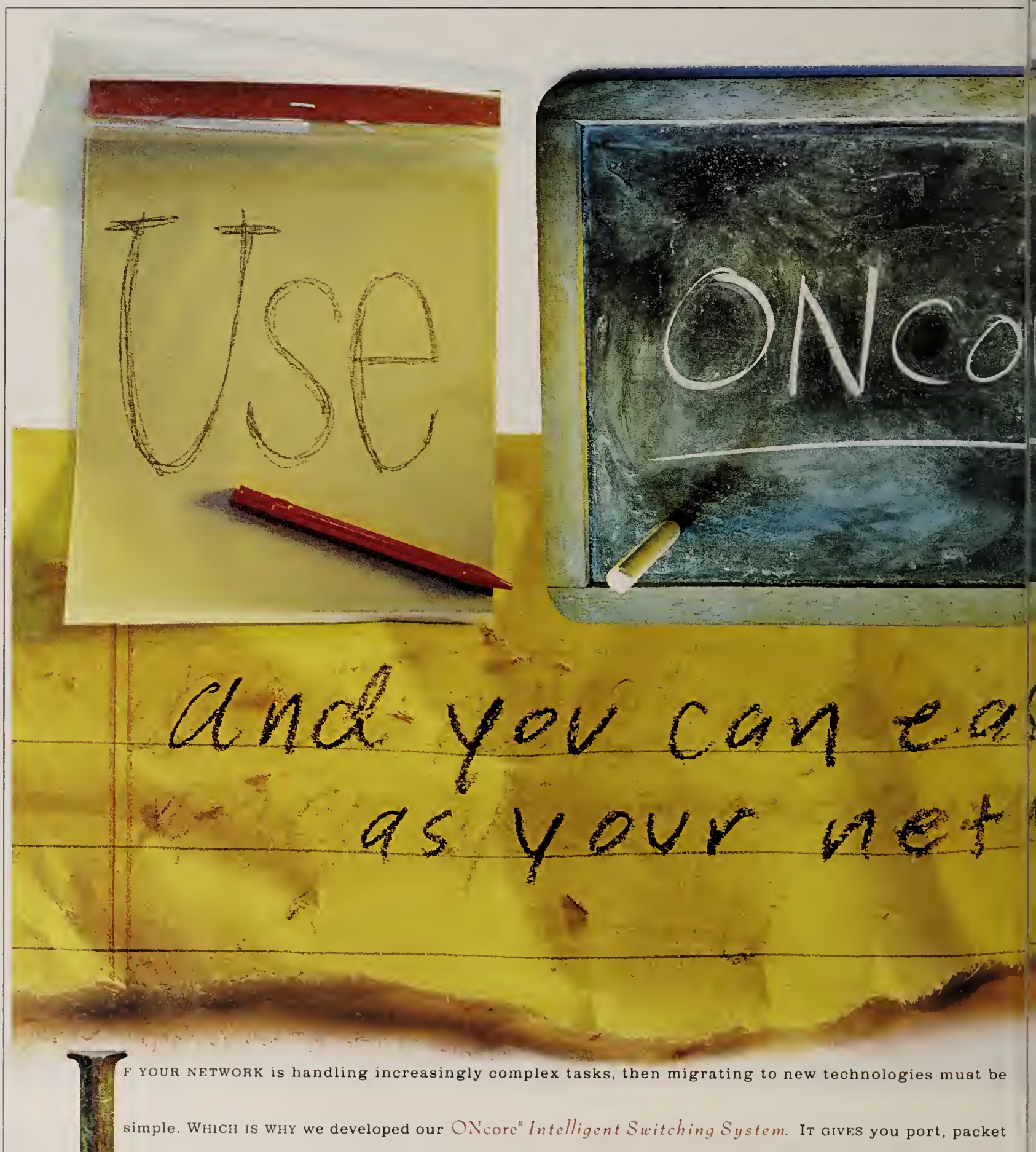
Concord Communications

- **Universal Poller**

What it is: Software application
What it does: Retrieves SNMP data from networked LAN hubs and Rmon agents
Benefit: Adds to data that can be analyzed by Trakker network management system
Price: $7,495 for 50-segment license
Availability: December

- **Network Health**

What it is: Software application
What it does: Summarizes and analyzes current and past network activity
Benefit: Gives users early warning of potential network problems
Price: $12,495
Availability: December



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New Products

Microtest, Inc. has announced Compas, a network diagnostic tool.

According to the Phoenix firm, Compas runs tests, identifies problems and presents solutions for wiring, network and Novell, Inc. NetWare servers.

The product tests 10Base-T and coaxial Ethernet cables, connectors and hub ports for proper network connection and monitors network utilization, errors and top users. File server analysis and serial connection testing is also provided.

Compas costs $4,995.

▶ *Microtest*
(602) 952-6400

TechSmith Corp. has announced Enterprise Wide, a remote-access software product.

According to the East Lansing, Mich., company, Enterprise Wide provides remote users with seamless access to client/server technologies and LAN-based services and data.

The product was designed to optimize the transport process between workstations and LAN gateways. Enterprise Wide lets remote users connect into the network only when they are accessing enterprise applications, so telephone or X.25 charges are incurred only during actual network processing.

Prices start at $2,495.

▶ *TechSmith*
(517) 333-2100

Frye Computer Systems, Inc. has announced the Frye Network Management Platform-Software Update and Distribution System for Macintosh 1.0, a software distribution and file update tool.

According to the Boston firm, the Frye Network Management Platform-Software Update and Distribution System for Macintosh automatically updates and installs any file on a Macintosh network.

The product lets network managers automatically delete, copy or replace any file using hardware and software selection criteria.

The Frye Network Management Platform-Software Update and Distribution System for Macintosh 1.0 costs $995 for the first 50 computers and $895 for each additional 100 computers.

▶ *Frye Computer Systems*
(617) 451-5400

On Technology Corp. has announced AuditTrack NetWare Loadable Module (NLM), a network surveillance product.

According to the Cambridge, Mass., company, AuditTrack NLM provides an automatic view of user activity on Novell, Inc. NetWare 3.x and 4.x networks.

The product monitors access to the network from the server and was designed to be implemented across an organization. Features include security levels for multiple auditors, an intruder detection alert system and automatic wrapping of log files.

Prices range from $495 to $3,495.

▶ *On Technology*
(617) 374-1400

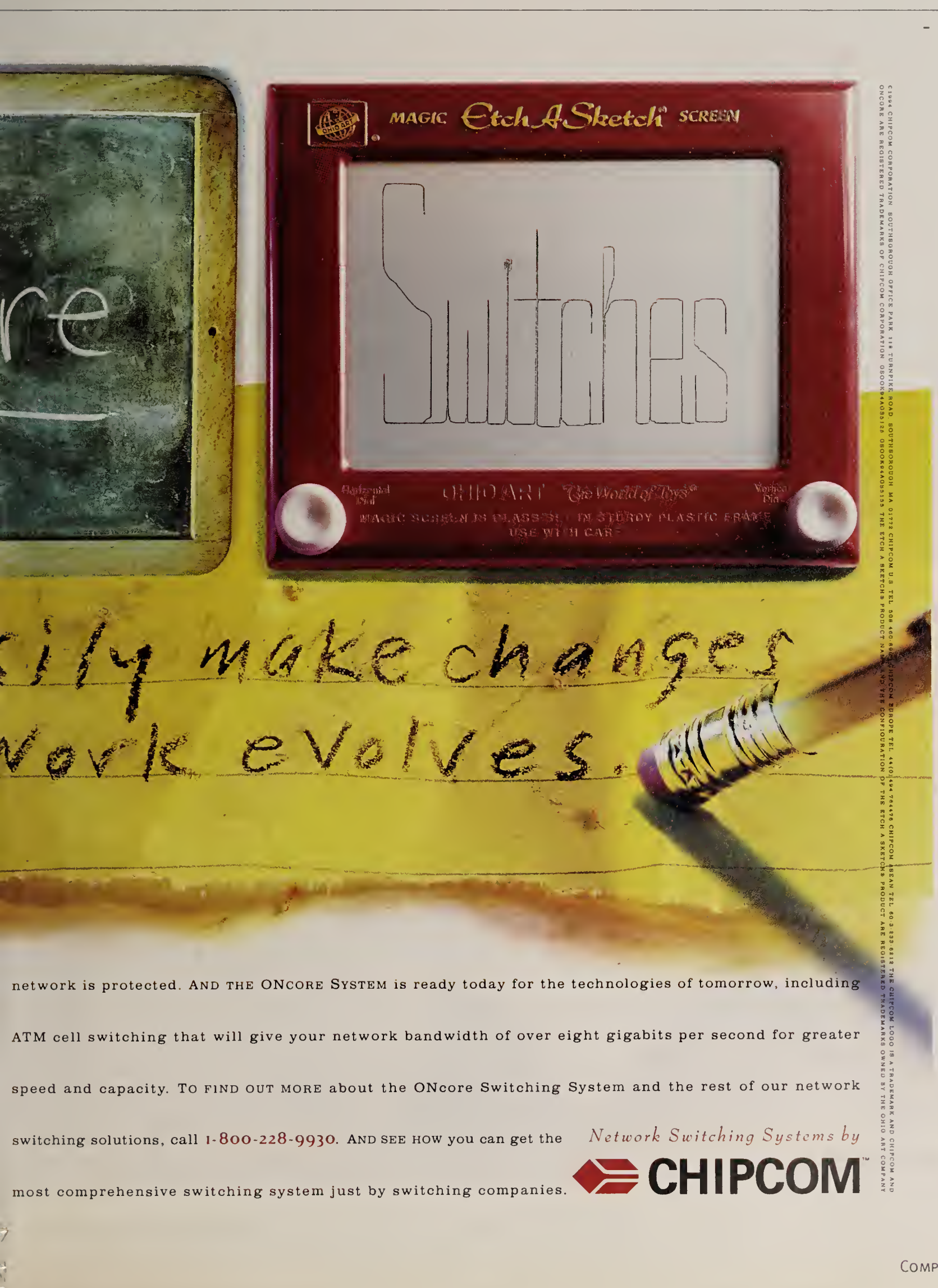
Frontier Technologies Corp. has announced SuperHighway Access for Windows 4.0, Internet communications software.

According to the Mequon, Wis., company, SuperHighway Access for Windows 4.0's Point-to-Point Protocol and Serial Line Internet Protocol support lets users connect Windows PCs to wide-area networks via a modem or serial port.

The product contains a package of Internet browsing utilities including Archie, gopher, Wide Area Information Servers and World-Wide Web. An Internet news reader features article viewing, changeable fonts, split view and posting.

SuperHighway Access for Windows 4.0 costs $149.

▶ *Frontier Technologies*
(414) 241-4555



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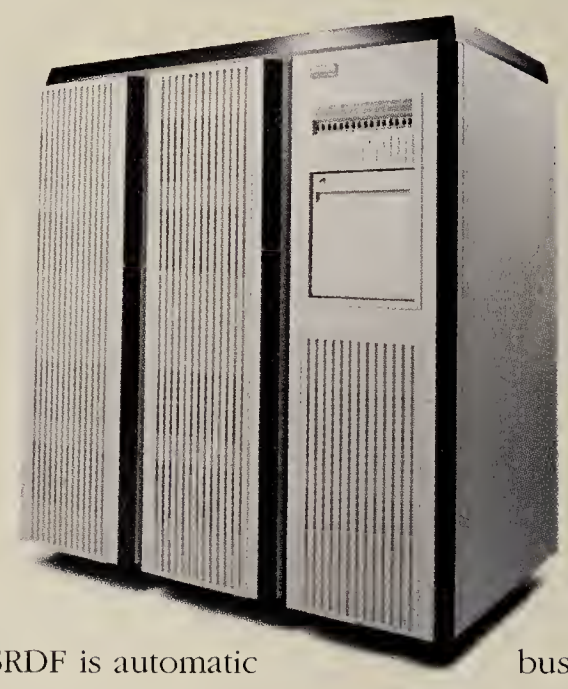
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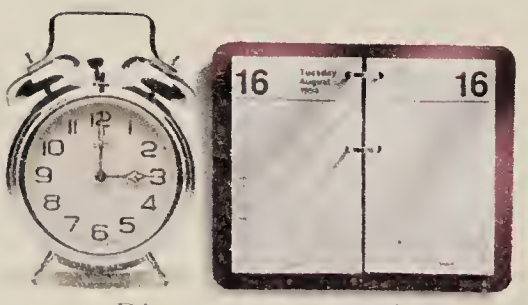
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System 11 marks philosophical turn for Sybase

Upgrade for database engine enhanced with built-in features

By Kim S. Nash

Sybase, Inc.'s plans for its next big database release, dubbed System 11, call for significant architectural changes to System 10 that represent an about-face for the company on some basic database philosophies, according to several Sybase users and analysts interviewed recently.

Users of System 10 or its predecessor, SQL Server 4.92, had many suggestions for System 11 engineers, not the least of which was a plea for better scalability and security.

System 10 is fine for small symmetric multiprocessing loads of four or six CPUs, said Harold Aaron, president of Softport Systems, Inc., a database consulting firm in New York. However, he said he has had to deal with "some issues in how it scales up into very large configurations" of several gigabytes of data or beyond eight CPUs.

"And I have clients with apps that could outstrip the current capability [of SQL Server] in the foreseeable future," Aaron added. Softport consults for major New York firms such as Citibank NA, which runs a financial reporting application of several gigabytes on System 10.

Indeed, one of the most significant enhancements planned for System 11 is better parallel processing support built directly into the core database engine [CW, Oct. 17]. That move signals a change of heart at the Emeryville, Calif.-based firm, which previously maintained that the best way to scale — or do parallel processing — was via add-on products, namely Sybase's still-undelivered Navigation Server. That product is due out this quarter.

System 11 therefore shifts Sybase closer, at least philosophically, to rivals Informix Software, Inc. and Oracle Corp., which have traditionally added new features right into their database engines, said Herb Edelstein, an analyst at Euclid Associates in Potomac, Md. "It's time they really got in there and did some performance tuning," he said. "The [product] name really should be System 10 Turbo."



- System 11 is due to ship in phases during the next 12 to 18 months, starting with basic SQL Server enhancements. Cluster support is one feature that Sybase will release "later rather than earlier," Sybase said.
- Approximately 10% to 20% of Sybase's 16,000 installed sites worldwide have migrated to System 10 from Sybase's previous version, SQL Server 4.92, according to a company spokeswoman. Those numbers jibe with the typical 18-month pace of migration for major database upgrades, analysts said. System 10 has been shipping for a year; within the next six months, the number of in-production System 10 sites should balloon, they said.

In fact, internal documents on System 11 refer to it as "The Performance Story." But faster processing is not the only goal of System 11, said Berl Hartman, Sybase's vice president of product marketing. Easier administration through graphical monitoring tools and stricter security are also in the works, she said.

Sybase appears to be adopting at least a smidgen of Microsoft Corp.'s philosophy of linking the database to the operating system. Sybase does not plan to go so far as to favor one operating system over another, as Microsoft has done with Windows NT and its SQL Server database.

However, Sybase has recognized that client/server users want simpler systems administration, often via tighter integration with operating system facilities. So System 11 will support several Distributed Computing Environment (DCE) features.

DCE is middleware technology that lets users spread applications across multiple computer platforms with unified security, directory, file management and naming services. For example, users of System 11 would be able to type a single log-on for the database and the underlying operating system. The System 11 documents also said other DCE security options will be supported, such as encryption.

Oracle does not support DCE but has promised to do so in future releases.

Row by row

A perennial debate among database users has been page- vs. row-level locking. Sybase has so far provided page-level locking, which freezes up a "page" of rows and columns surrounding a piece of data being accessed by a user. However, some database users contend that row-level locking, which freezes individual rows in a database rather than pages, provides for faster processing in most applications because, in general, smaller amounts of data are locked up.

Sybase has not decided whether it will include row-level locking in System 11, but the system will let users do "dirty reads," or view data that is not yet committed to the database, said Jim Panttaja, president of Panttaja Consulting Group, Inc. in San Francisco. "And Sybase

Sybase, *page 111*

New IBM mainframe turns some heads in first month

By Craig Stedman

The general-purpose parallel mainframes IBM introduced in September are drawing a healthy amount of interest from users attracted by the reduced cost of buying and operating the CMOS-based machines. But analysts said IBM still has a tough road to travel to turn the System/390 back into a growth platform.

First of all, there is the need to ramp up the performance of the air-cooled Parallel Enterprise Servers (PES). The first incarnations use only a 13 MIPS processor and max out at about 60 MIPS across six of the chips — the same throughput a traditional water-cooled ES/9000 gets from a single CPU.

Another issue is application development for the System/390, or rather the lack of it. For IBM to accomplish its goal of getting the world to look at a PES as just another large server, customers and Unix software vendors must be enticed to write programs for the mainframe again, acknowledged Linda Sanford, general manager of System/390 systems.

Nonetheless, the early returns are generally positive on the launch of the PES machines, which are the first of IBM's parallel systems to not require the latest versions of MVS and other system-level software. IBM would not disclose how many general-purpose units it has shipped thus far, but analysts said the new hardware is getting a lot of attention from users.

Convincing customers

Because of the performance limits of the PES, IBM originally planned to target users of older mainframes such as the 3080 and 3090. But Charlie Burns, a research director at Gartner Group, Inc. in Stamford, Conn., said more up-to-date shops are also looking closely at the machines because of the potential savings on price, energy usage, floor space and maintenance fees made possible by the CMOS technology.

The PES systems could be used "in a lot more cases than people think, but the bigger problem is the emotion of it," Burns said. "Users are trained to buy the fastest processor they can find, and now they're being asked to buy a slower one. They have to be convinced that everything will be OK."

The Sabre Group, which handles reservations and ticketing for parent company AMR Corp.'s American Airlines and other clients, was one such customer. Terrell Jones, president of the Sabre Computer Services unit, said he did not think PES was powerful enough for the airline's demands at first. But Sabre, based in Fort Worth, Texas, has been running about half of its ticket pricing workload on a pair of PES systems since July [CW, Oct. 17].

Rensselaer Polytechnic Institute in Troy, N.Y., also plans to off-load a multimedia instruction application from its ES/9000 to a PES in the near future, according to Jack Wilson, director of the school's Center for Innovation in Undergraduate Education. "If you look at price/performance and maintenance costs, the new systems look awfully good to us," Wilson said.

Students tap into the multimedia application at a rate of 4,000 to 6,000 hours

IBM, *page 111*

Reasons to be cheerful

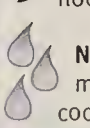
IBM'S PARALLEL ENTERPRISE SERVERS HAVE THE FOLLOWING POINTS IN THEIR FAVOR, ACCORDING TO USERS AND ANALYSTS:



Lower cost. IBM is selling PES systems for $15,000 to $16,000 per MIPS; new ES/9000s still cost about $25,000 per MIPS, and upgrades of water-cooled machines remain above $30,000 per MIPS.



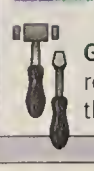
Reduced maintenance and environmental costs. The CMOS-based technology uses only about 20% of the floor space and 10% of the power required by a 3090.



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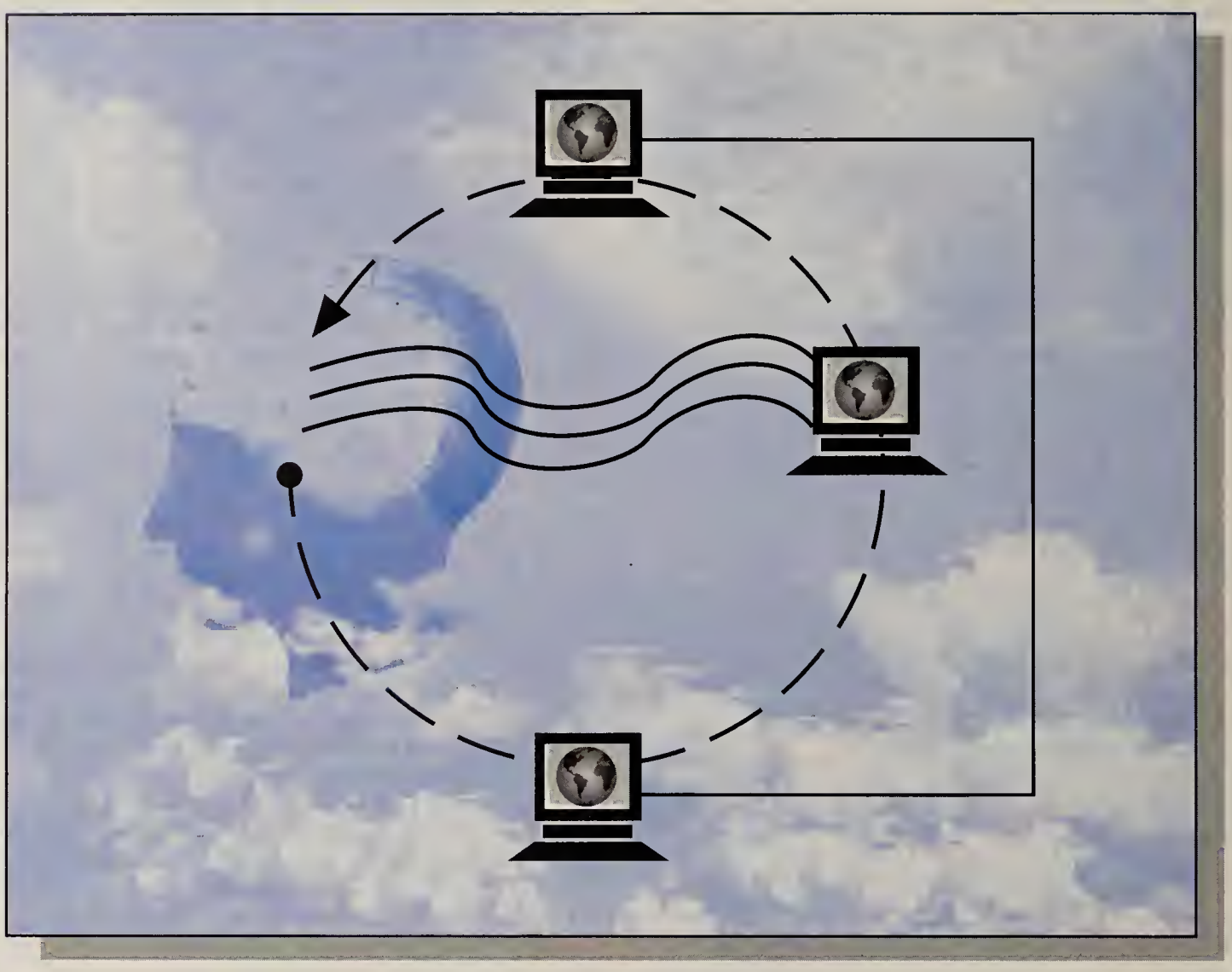
No need for software conversion. PES should run existing System/390 applications and system-level software without modification.



General-purpose hardware. Does not require most recent versions of MVS and other software, as does the Parallel Transaction Server announced last spring.

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DWAWC03

Astea enhances data views

By Rosemary Cafasso

Astea International, Inc. recently began shipping an upgraded version of its dispatch software that includes long-awaited front-end components to give users a better view of customer service data.

Dispatch-1 is used for managing service scheduling, parts tracking and billing. It is part of the company's Customer Enterprise Series of sales and support software. Release 6.0 will include a Customer Access module that gives service customers a view into their service provider's operations. Two other front-end components — Manager's Window and Executive Access — will give managers high-level views of service data.

"A lot of people are now mining their customer service systems for business information," said Hugh Bishop, an analyst at Aberdeen Group in Boston. "These are systems that are in direct contact with your customers."

Astea users contacted recently said they have been waiting for these modules in order to use the Dispatch-1 system more effectively. They said the Customer Access module should help boost relationships with their customers, and they expect the managers' tools will help them get a better handle on service operations.

"We will purchase all three," said David Duek, MIS and business service manager at Polaroid Corp.'s Medical Imaging Systems division in Newton, Mass. He said the Customer Access component will be "extremely important."

Duek said he plans to provide this component to Polaroid's customers for order entry so they can side step the telephone calls and order-entry personnel and place orders more quickly.

"For customers placing a lot of orders, it eliminates the calls and the paperwork, and it eliminates confusion," Duek said.

Jay Meath, customer service MIS administrator at Physical Electronics in Eden Prairie, Minn., said he plans to provide his company's customers with the access component as well. But he expects to provide it for monitoring activities only, so customers can view inventory, work orders and service history.

"We have several customers who are really excited about this, so we are waiting for it," Meath said.

The Executive Access tool, according to Duek, is targeted at senior management who are not interested in operational data but who want to "see things in pie charts." The Manager's Window will be used more extensively, Duek predicted, because it will help midlevel managers do a better job of running day-to-day operations. For example, a manager can glance at service personnel status, determine what region is overstaffed and redeploy staffers.

Before, "it was very tough," Duek added. "We'd have to run reports and use gut feelings."

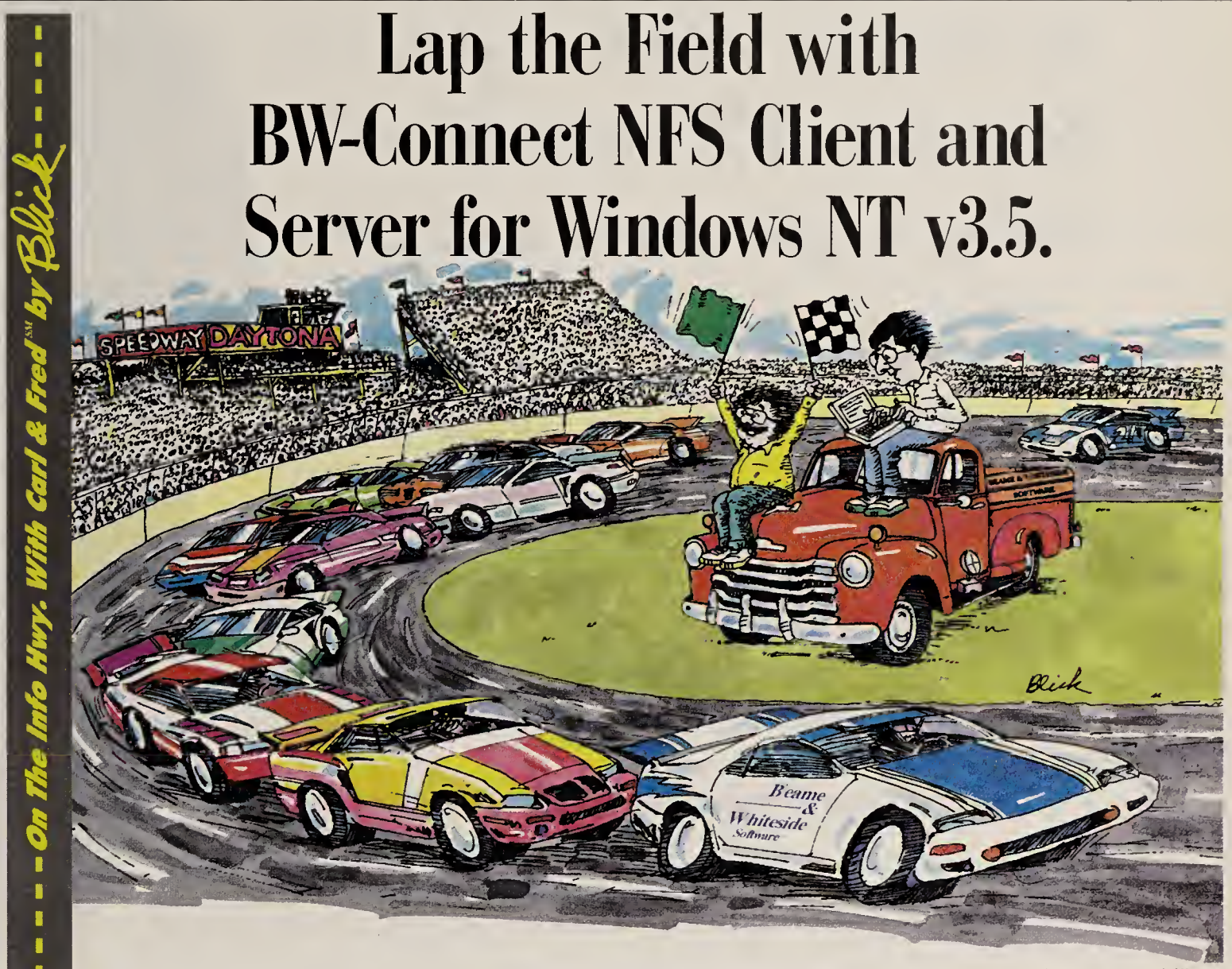
These decision-support functions could give customers "a real competitive advantage for implementing Dispatch-1," said Judy Hodges, an analyst at International Data Corp. "From my perspective, something like the Manager's Window is a fundamental business need."

New views

Release 6.0 of Dispatch-1, Astea's customer service software, contains the following new features:

- **Customer Access:** Front-end component installed at customer site that provides access to inventory and service personnel data; can be used to place orders.
- **Executive Access:** Executive information system-like tool that provides high-level data on service operations.
- **Manager's Window:** Desktop software to view service activities and perform such functions as reassigning personnel or resources.

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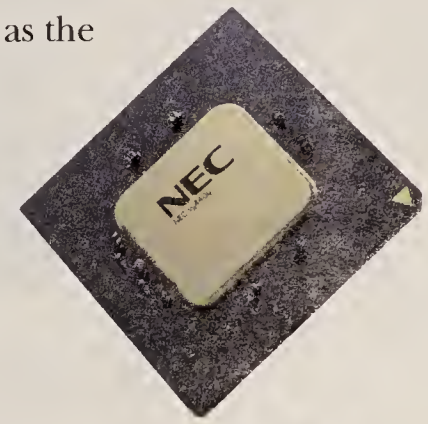


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Commentary

George Shaffner

No miracle, open systems

According to this year's industry surveys, users who were already dissatisfied with proprietary systems are now becoming disillusioned with open systems. Divine expectation, it seems, has been met by mortal experience.

Among hard-core information technology agnostics, who are immune to disillusionment, open systems are no more than computers in which low-value differentiation has been abolished in favor of industry consensus (called standardization). Unfortunately, there is no such industry consensus that will actually lower the entry cost — the cost of acquiring, installing, programming and testing — of any new system.

There is also little in the elimination of low-value differentiation that will lower routine maintenance costs. During these first two stages of the investment cycle, in fact, proprietary systems may be no more expensive than open systems and, in some circumstances, may even be less risky.



Therefore, divine expectations notwithstanding, an open system is unlikely to perform radically better than a proprietary system in the initial years of any new or upgraded application.

Open systems do start to shine, however, when it's time to change something. Because low-value differentiation has been eliminated, the cost of adding a new software component, integrating another new system or upgrading a network promises to be much lower than the cost of a proprietary solution, and you're likely to have many more choices.

By freely installing proprietary systems for more than 30 years, we have created an environment where we can change a company's business faster than we can change its computing systems.

In contrast, proprietary systems maximize differentiation. Like in-laws, they are almost impossible to change and even harder to remove. Thus, by freely installing proprietary systems for more than 30 years, we have created an environment where we can change a company's business faster than we can change its computing systems — which may not have been the career image we originally wanted to project to the CEO.

The most costly form of technological change, by the way — and the most ignored component of the investment cycle — is exiting. The only way to minimize exit costs from a proprietary system, as we all know, is to buy another one just like it, only newer, thereby postponing the inevitable conversion to another generation. (It has been theorized that this is how the term legacy was originally coined: High-depreciation proprietary systems are the outgoing CIO's legacy to the incoming CIO.)

Alternatively, open systems promise real choice at exit time, real competition from vendors and minimized cost of future conversion due to the ever-expanding elimination of low-value differentiation. But you have to get there first.

If your organization is under tactical budget pressure, then conversion avoidance, meaning an upgrade of your installed proprietary system, may make genuine financial sense. For new applications, however, there are no near-term economics to justify the long-term maximization of change and exit costs; that is exactly what you will get with proprietary systems — by definition. Therefore, proprietary solutions are likely to be substantially inferior to open solutions for new applications once the entire investment cycle — entry, maintenance, change, exit — is taken into consideration.

Just don't expect miracles.

Shaffner, former chief operating officer at X/Open Co., is a consultant in Fairfax Station, Va.

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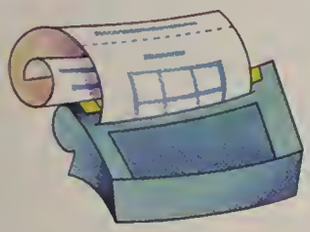


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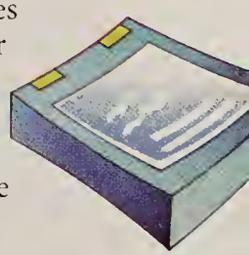
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Introduction



Convergence is here. In 1995, portable PC growth will exceed that of desktop PCs. Portables are nearing commodity status — all offer certain basics in processing speed, memory, display and functionality. As this evolution has occurred, portable users have demanded that their devices mimic their desktop counterparts. Increasingly, these professionals are oriented toward using their PCs to communicate while on the road.

Communications for mobile professionals means sending and receiving E-mail and fax messages, connecting to the corporate database and accessing various information services and networks. As remote communications have become increasingly reliable and user-friendly over the past five years, more and more portable computing devices are being bundled with software for that purpose. By 1995, virtually every portable will ship with a PCMCIA slot. But there is also a paradigm shift. Although the requirement for remote communications via landline networks is being increasingly fulfilled, there are many instances where mobile professionals want to roam free of traditional communication networks. This type of freedom requires wireless communications.



Until recently, mobile communications involved hunting for a phone jack to tie into the landline network. For mobile professionals, this often meant moving hotel room beds and couches, and then navigating through the hotel PBX. There are similar tales of woe from episodes in airports and other public places, at customer sites or in vehicles. Then there are industry-specific cases where the need for wireless communications capability is even more critical. The real estate agent who wants to close a deal, the insurance agent at a disaster site or the field service representative at the client location all represent instances where the ability to send wireless data offers both a strategic and competitive advantage.

Wireless voice has been one of the hottest markets for the past 10 years, and paging has grown up as the simple and inexpensive means of one-way communication. Now, however, wireless two-way data communications capability is becoming a reality. In this White Paper, The Yankee Group presents its evaluation of the state of mobile communications and where it is headed over the next several years. Our assessment embraces four key questions:



- What is the demand for wireless communications capability among mobile professionals and in the enterprise?
- What are the vertical and horizontal applications for wireless communications?
- What hardware and software will be the enablers and facilitators of wireless communications?
- What are the network infrastructure options, and which are most suitable for particular requirements?

This White Paper is written by The Yankee Group's Wireless/Mobile Communications Research team. The Yankee Group is an internationally recognized leader in strategic planning, technology forecasting and market research. Yankee's Wireless/Mobile Communications Research program focuses on the key technology, regulatory, competitive and marketing issues affecting the mobile services and wireless technology markets in the 1990s. Our research is delivered in the form of in-depth reports, White Papers and Bulletins, customized briefing sessions and on-line access to our analysts. For more information on the Yankee Group, please call Joelle Snow at 617-367-1000. For more information on the White Paper Program, please call 508-879-0700.

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ILLUSTRATION BY MARK S. FISHER





With nearly 40 million combined cellular and paging subscribers and over six million portable computers in the U.S., attention is now turning toward building mobile data networks (MDNs). MDNs create a convergence of wireless communications and portable computing that provides mobile professionals (MPs) with remote desktop capabilities without the requirement of a landline network.

As vendors strive to build a market, and users evaluate wireless MDN technology, the critical issue is determining the strategic application areas that will yield the maximum return on investment and figuring out ways to cost-justify those applications. Many users still have a hard time understanding where the technology will fit for them. They lack confidence in emerging technology and are deterred by the inherent risks and implementation costs.

Wireless Communications

Creating the business justification may require users to investigate new processes that can be achieved through wireless mobile technology rather than simply "mobilizing" existing applications. This is the mantra that must be presented to manage-

ment: When MDN is allowed to change traditional business practices and enable new procedures it can ultimately achieve greater payback in unprecedented levels of efficiency and productivity.

The Yankee Group's Corporate Survey

A Yankee Group survey of telecom and IS managers completed in June 1994 reveals that the primary driver behind MDNs is customer satisfaction. Second is the need to generate revenue. All companies are under pressure to increase productivity. Wireless communications is perceived as a means for companies to get closer to their customers. The survey demonstrates increased awareness of wireless technology and its benefits. A similar survey conducted a year earlier revealed that companies were, at best, speculating about how they might incorporate wireless into their IS communication strategies. While the 1993 survey recorded that only 9% had begun implementing, today 32% are at some level of implementation. Approximately two-thirds of these are implementing initial MDN applications and pilot testing, and one-third claim that they are already using MDN products in multiple locations (Figure 1). Another 32% of respondents are considering acquiring MDN equipment.

The Yankee Group believes that except in special situations such as telemetry, wireless will supplement but never replace wired facilities. Users will continue to use wired networks where most appropriate and will look for services and devices that allow them to switch easily between wireless and wired modes. Over the next two years, there will be significant growth in all of the identified sectors. However, the greatest projected penetration is clearly among traveling executives and field sales (Figure 2). Almost all respondents have plans to support traveling executives; an overwhelming majority plan to do so within the next two years.

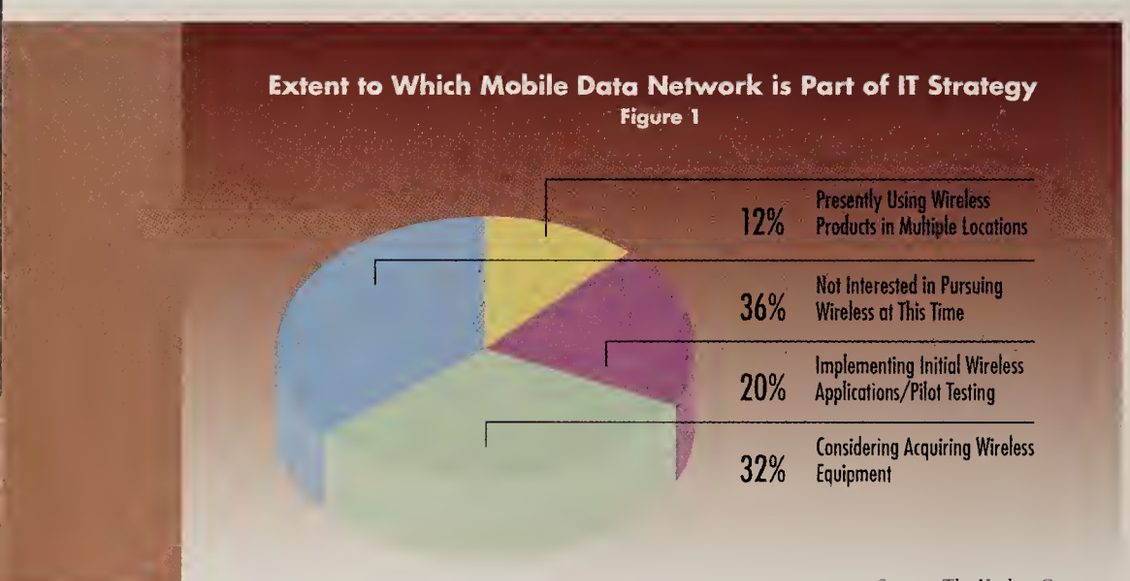
Users will continue to use wired networks where most appropriate and will look for services and devices that allow them to switch easily between wireless and wired modes.

The Yankee Group believes that MDN penetration is determined by the degree to which individual corporations are prepared to integrate wireless technology with their existing applications. This depends on the company's willingness to establish higher quotas for service or sales calls, cut service people or cut the budget. Pitney Bowes, for example, was so confident of the gains of wireless technology that it committed to reducing the numbers of its dispatchers and dispatch centers before implementation. The company was able to consolidate 18 dispatch centers to six and reduce dispatchers by 60%.

How does MDN become the enabler of increased productivity? The keys are immediacy of information access and the ability to act. With immediate inventory look-up, field reps know if a required item is in stock. As a result, they can be more responsive to the customer, and they can bill immediately. And when there is an opportunity to close a sale right on the spot, online access to process the order and complete a contract is critical. The impact goes beyond customer service to a faster billing cycle turnaround.

The greatest potential application growth for MDN, however, is in E-mail and fax, which are popular among the majority of respondents. Numerous vertical and horizontal applications depend on E-mail as their transport mechanism. Examples include forms routing and workflow, calendaring and group scheduling, and database updates. There is also significant projected growth of information services over wireless facilities (Figure 3).

Extent to Which Mobile Data Network is Part of IT Strategy
Figure 1



Source: The Yankee Group

Mobile Computing Platforms

The devices required for MDN implementation are placed in three categories by The Yankee Group:

- notebooks and subnotebooks
- industry-specific handheld units and vehicle-mounted devices
- personal digital assistants (PDAs), palmtop units, personal intelligent communicators (PICs), organizers

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Each of these platforms has a market centered around it with established vendors, newcomers and different applications. The notebook market represents the continuation of the desktop market and is the largest of the three platforms. The industry-specific market is the sleeper of the group. This is a $1 billion market that is growing rapidly and dominated by three vendors: Symbol Technologies, Telxon and Norand. The PDA and PIC market is just emerging.

PCMCIA: Key Hardware Enabler

The key hardware enabler for mobile computing is the development of credit card sized communications devices based on standards issued by the worldwide Personal Computer Memory Card International Association (PCMCIA). Headquartered in Sunnyvale, California, PCMCIA originally set out to improve the memory capacity of portable computers and consumer electronics devices, but quickly expanded its mission to include nearly every type of computer input/output function, including memory, storage, and connections to wireless WANs, LANs, landline telecommunications networks and data communications networks.

PCMCIA slots have quickly become standard issue on every mobile computing device platform. The Yankee Group believes PCMCIA cards will drive the evolution of the MP, industrial and consumer computing markets by providing a convenient form factor for communications peripherals. Cellular phone users, pager users and E-mail users can now directly integrate this technology into their computing platforms, achieving a degree of integration and synergy that will drive the growth of both the communications and the computing markets. During 1995 the pace of integration will accelerate as PCMCIA cards that provide connectivity to two-way wireless data networks, such as CDPD, RAM and ARDIS, hit the market.

Notebooks Reaching Out

Notebook computer users require connections to remote hardware and software resources. Recent developments in software programs are making these connections easier and more economical. Remote computer users have for years been able to use various terminal emulation software programs to access remote computer resources. But with the proliferation of portable computers and the need to provide wireless access, they are increasingly asking for solutions that deal directly with the limitations of wireless computing, including:

- low bandwidth
- high latencies
- frequent interruptions
- high service costs
- low security.

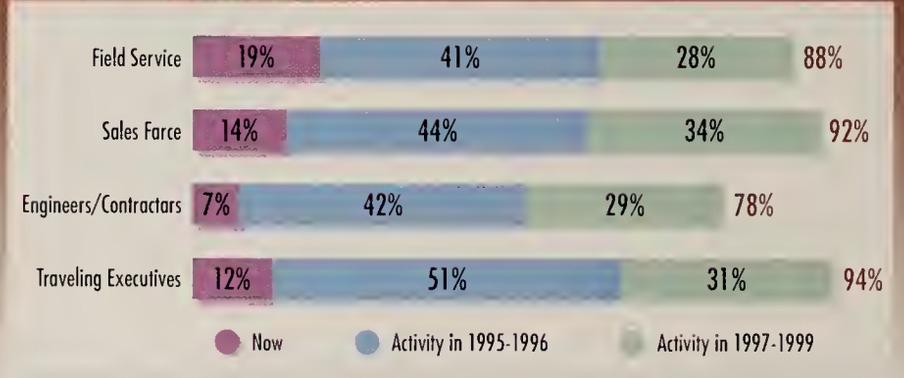
Software application programs that provide remote access for mobile computer users fall into three major categories.

Application specific programs are customized versions of desktop programs designed specifically for wireless and landline remote access where bandwidth is limited. Companies such as Lotus have attempted to market versions of popular mail or spreadsheet applications for specific wireless networks at considerable expense. The Yankee Group sees this trend dying out as networks and operating systems become more standardized around communications protocols.

File transfer and file synchronization programs are available to handle the remote sending and receiving of files and the reconciliation of different files. These programs address the problems mobile workers have managing multiple copies of files on different computing devices. On the horizon in this category are software programs that monitor files on both remote and host computers, and send only changes to the files — not the whole file — thus addressing the low bandwidth limitation of wireless networks.

Remote access to LANs are programs that use dial-up landlines or wireless networks to allow remote computers to link themselves to LANs by either taking control of LAN-connected clients or by placing themselves as nodes on LANs.

MDN Users — Current and Planned
Figure 2



Source: The Yankee Group

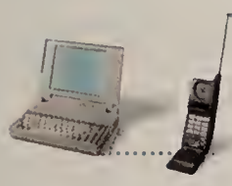
Industry-Specific Platform Spawns Middleware

In order to help businesses implement wireless data transmissions, a number of companies are working



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Travelers' Use and Interest of Mobile Applications
Figure 3

Application	Non-mobile Professional	Mobile Professional	Mobile Professional Interest (not currently using)
Checking Vaice Mail	7%	54%	32%
Getting Paged or Beeped	7%	50%	12%
Jaint Praject Sharing	12%	39%	19%
Access Company Database	16%	52%	38%
Send/Receive E-Mail	5%	36%	30%
Send/Receive Faxes	24%	77%	35%
Access Public Information Service	3%	25%	18%

Base: 1,860 Respondents

Source: The Yankee Group

on developing middleware that works between application software and network systems. Middleware improves the efficiency of wireless networks, particularly various packet data networks, by managing the communications protocols necessary for data transmission and providing common application programming interfaces (APIs) for third parties. Middleware represents an important step in developing communication languages and operating systems that make wireless transmissions economical and manageable. Middleware also allows developers to bring products to market more quickly and lowers their learning curves.

PDAs and PICs Lack Links

PDAs and PICs must communicate if they are to catch on. The utility of this class of devices depends substantially on its ability to access remote databases, provide users with information and send and receive messages and E-mail while on the move. All of the vendors in this field are in a race to make communications and computing a reality. Although sales in this category have been far lower than many observers predicted, it will experience real market growth with the advent of true communications functionality.

General Magic, of Mountain-View, Calif., recently introduced two software technologies designed to maximize communications, both wireless and wireline, for PDAs and PICs. Magic Cap is an operating system, while Telescript is a communication language that uses "intelligent agents" for new network services. Sony, AT&T, Motorola, Toshiba and others have licensed these technologies and are currently, or have plans for the near future, to market devices and services based on these technologies.

Network Infrastructure for Wireless Communications

There are four broad categories of network infrastructure solutions for two-way wireless data communications: cellular, dedicated packet radio, enhanced specialized mobile radio (ESMR) and personal communications services (PCS), the last of which comes in both narrowband and broadband. The most viable circuit-switched options for users today are the cellular networks, an emerging packet switched capability called Cellular Digital Packet Data (CDPD) and the private data networks offered by RAM Mobile Data and ARDIS. ESMR and PCS present possibilities for the future.

For the past three years, ARDIS and RAM Mobile Data have been battling head-on to capture customers and recoup the investment made in network infrastructure and service development. Their efforts are finally being rewarded in an upswing in customer commitment. Together, they secured more than 8,000 new customers in the first half of 1994. Both of these service providers are continuing to evolve offerings in footprint expansion, building penetration, network management and speed upgrades. ARDIS is in the process of upgrading from 4.8 Kbps to 19.2 Kbps in major cities. A speed upgrade from its current 8 Kbps is also among RAM's development priorities. Today, both have quasi-nationwide network deployment (Figure 4), and a variety of available subscriber equipment and application support.

There are architectural differences in the ARDIS and RAM technologies that relate to their original network philosophies. However, in service capability and customer support they are becoming increasingly similar. RAM is based on the Mobitex technology developed in 1986 by Ericsson in Sweden. Today, the U.S.-based network is using the 14th version of Mobitex software and third generation of hardware.

RAM's network was designed for messaging with inherent roaming, store-and-forward and broadcast capabilities. RAM also provides application developer partners with RAMparts, a message-enabling toolkit that allows the company to incorporate fax origination, mail and paging into its applications. Other kits are available from third party connectivity partners.

ARDIS was designed in the mid-1980s to provide IBM field service access to host computer systems. Its

initial focus, therefore, was providing host connectivity to remote users of closed corporate groups in a private network configuration. Despite that orientation, since late 1984 it has had public switching capabilities, including multiple host protocol support, a per-packet billing system and positive message acknowledgment. ARDIS has added store-and-forward and broadcast features and a peer-to-peer personal messaging service. Motorola recently bought out IBM's share in ARDIS and became the full owner. Motorola's commitment should encourage ARDIS migration toward personal communications services via its support for Motorola's PDA, the Envoy.

Neither RAM nor ARDIS has an E-mail service per se, but both vendors have relationships with RadioMail, a wireless E-mail gateway service that enables remote individuals to tie into their corporate E-mail services and into public networks.

Increasing CDPD Availability

CDPD, the packet data switching technology overlaid on the analog cellular network, is just beginning to be made commercially available. Although a consortium of carriers committed itself to uniform CDPD services, individual carriers are implementing it first in the major cities in their service areas. User devices are limited, but while still in the early stages of deployment, CDPD has the backing of a number of key vendors. AT&T, Hughes Network Systems, Motorola and PCSI are among those providing network infrastructure. IBM is incorporating a CDPD modem into its ThinkPad notebook computer.

The success of CDPD is dependent upon two issues: the commitment of the cellular carriers to full deployment, and the performance of CDPD under heavy traffic loads. The Yankee Group believes that by the end of 1994, approximately the top 25 metropolitan areas will have CDPD service available, and that it will take another two years to resolve the technical and logistical issues that prevent CDPD service from operating seamlessly nationwide.

Circuit-Switched Data

The attraction of the circuit-switched method is its simplicity for existing cellular phone users. The user merely adds modem software to the base cellular technology and makes a data connection that is the same as a wireline connection. Host applications require little or no modification. On the downside, analog cellular was not designed to carry data, and there are reliability limitations with varying signal strengths, environmental interference and cell hand-offs. However, efforts to increase reliability are taking place in the form of enhanced cellular data protocols with built in error correction. These include AT&T Paradyne's ETC, Microcom Corp.'s MNP-10 and Celeritas Technologies' Ltd TX-Cel. The cellular carriers are also giving greater priority to data services, supporting these protocols via their modem pooling services and designing pricing schemes geared more towards data. UPS was the first corporation to demonstrate confidence in circuit-switched cellular for data. Others have followed, including Walgreen and Northwest National Insurance Co. Circuit-switched data will become a stronger option with the next generation of digital cellular systems.

The Future of MDN

There are 1.2 million MDN users today, at least 50% of which are private network users in such areas as utilities, government and public safety. Market growth will accelerate by the end of 1995. By then, the cellular operators will have rolled out CDPD networks nationwide, PCS will be available and there will be greater availability and choice of wireless mobile devices and applications. By the turn of the century, there will be a total of almost 10 million MDN users.

Cellular Network Coverage

Figure 4

	RAM Mobile Data	ARDIS	CDPD	Circuit Cellular
Metro Coverage	7,500 cities in 300 MSAs	10,700 cities in 400 MSAs	Limited coverage in 9 metros, June 1994; we anticipate 25 fully implemented by year-end	Approximately 50,000 cities in 734 MSAs
Extended Mobile Coveroge	Broad	Broad	Limited today	Depends upon hand-off capability between carriers
Rooming	Automatic throughout network; no charge	Automatic throughout network; no charge	Standards and basic agreements by year-end	Additional charge: up to $3.00/day, $0.90/minute
Internationol Rooming	Devices and networks use same application interfaces on all Mobitex systems	Devices and networks use same application interfaces on all Motorola DataTac systems	No, could only connect with other (AMPS) networks	No
In-Building Penetrotian	Strong in top metros, and extending	Strong	Area-specific; potential to be stronger than circuit cellular	Adequate; stronger in high-density areas

Source: The Yankee Group

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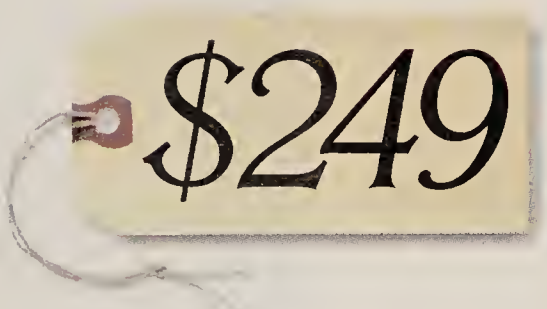


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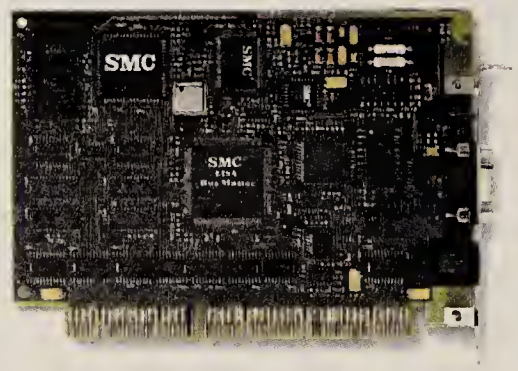


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IBM mainframe

CONTINUED FROM PAGE 91

per week, and Rensselaer "can't imagine how else we could do this" other than with a System/390 machine as the video server, Wilson said. The PES hardware should be "a good way to take some of the cost out of the system," he added.

Hot and cold

IBM plans to ratchet up the speed of its CMOS-based System/390 processors from 13 MIPS to 25 MIPS next spring. That would be followed in 1996 by chips in the 40 MIPS range, which would be "perfectly acceptable" for replacing most of the water-cooled ES/9000s now in use, said Charlie Burns, research director at Gartner Group.

Fast return

Alco Capital Resource, Inc., an office equipment leasing vendor in Macon, Ga., shifted its financial and lease history applications from one of IBM's low-end rack-mount ES/9000 9221s to a PES in September. It reaped immediate benefits, said Daryl Hayes, Alco's information services manager.

"We think we've found heaven," Hayes said. Alco is getting about 500 I/Os per second from a single PES processor, more than triple what the 9221 could do. As a result, its nightly batch processing is finishing shortly after midnight rather than at 7 a.m., he noted.

"Now we have recovery time, so if we have any problems [in the batch run], it takes the pressure off," Hayes said. Reports can also be sorted and distributed during the night "so that users get them first thing rather than having to wait until midmorning," he added.

Bob Djurdjevic, president of Annex Research in Phoenix, said the PES hardware appears to have been "very well received" thus far. Djurdjevic added, however, that IBM cannot rely too much on shops with old 3080s and 3090s, which he described as "deadbeat accounts" that typically buy used systems.

Switching from a water-cooled mainframe to a PES machine might not yield huge savings on operating costs despite the reduced cooling requirements, Burns said. Disk and tape subsystems typically generate much more heat than the mainframe processors themselves, he noted. "It looks really good on paper, but it doesn't necessarily turn into green dollars instantly," Burns said. Still, he added that the CMOS technology provides "a tremendous deal" on pricing and maintenance charges compared with upgrading a water-cooled machine.

Sybase

CONTINUED FROM PAGE 91

users won't be kept waiting," he added.

Money is becoming a bigger issue for database users, especially in view of Microsoft's aggressive pricing for its SQL Server database.

Keith Cobb, database analyst at The Associated Group in Indianapolis, said that although he is not unhappy with Sybase pricing, he will take "a look at features and pricing in the next release and will compare [them] to what Microsoft is doing."

Costly move

But the cost of running the software also concerns users. The Alberta Career Board, for example, has seen support costs for its four Sybase SQL Server licenses swell 45%, from $67,000 last year to $97,000 this year, said Felix Fridman, director of information systems at the medical agency in Edmonton, Alberta.

Some of the increase stems from the Career Board's migration from IBM mainframes to Sun Microsystems, Inc. Unix servers. "We lost a lot of our staff when we moved from mainframe to Unix, so we had to rely on the software vendors more and more for help," Fridman said. He had to pay for that help in the form of more extensive maintenance contracts, Fridman added.

Sybase officials declined to specify possible changes in pricing under System 11. "We're still examining pricing issues. We're not prepared to make any statements about that," Hartman said.

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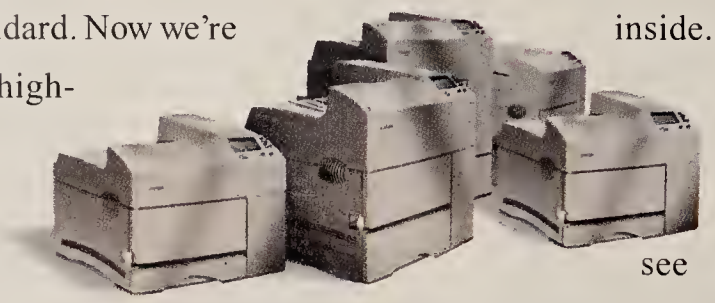
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New Products

Uniplex Software, Inc. has announced Uniplex Business Software Version 8.0, an integrated office suite for Unix.

According to the Irving, Texas, firm, Uniplex Business Software Version 8.0 provides customizable office productivity, communications and graphics applications for Unix in both character-based and X Window System-based environments.

Features include improved electronic mail, a new database engine, additional database links and optional migration paths to Uniplex's messaging backbone product.

Application packs include Uniplex II Plus with a word processor, spreadsheet and relational database; Uniplex Advanced Office Systems groupware applications and E-mail; Uniplex Advanced Graphics System; Uniplex Datalink; and Uniplex Windows, an X Windows-based graphical user interface.

Prices are $100 to $500 per user.

▶ *Uniplex Software*
(214) 556-0106

Createprint of America has announced Createprint Version 3.0, electronic forms software for Unix and VAX systems.

According to the Canoga Park, Calif., company, Createprint Version 3.0 lets users print high-quality laser forms from databases with no change to application software. It automatically controls every print job without operator intervention.

Users can design advanced forms and upload them to the Unix or VAX platform. A data-mapping feature provides relocation of data from an area on one form to a different area on a new page.

Prices start at $2,995.

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Relational Architects International has announced Smart/Restart 3.3, application restart software.

According to the Hoboken, N.J., company, Smart/Restart 3.3 makes production jobs restartable from the point of failure or any prior checkpoint without changes to source code.

The product synchronizes database updates with applications' working storage contents and sequential file positions. A monitor provides users with a real-time view of statistical summaries for SQL activity, file I/O and CPU usage.

Other features include the ability to suspend, resume and cancel restartable jobs and store checkpoints in either DB2 tables, Basic Data Access Method files or tape data sets.

Prices start at $11,600.

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ProfitKey International, Inc. has announced Rapid Response Manufacturing (RRM) Version 6.0 for the IBM AS/400.

According to the Salem, N.H., firm, RRM Version 6.0 is an integrated, real-time manufacturing control system that emphasizes scheduling capacity and cost management.

Features include an enhanced purchasing system, a Common Sense Scheduler, interactive creation of report writer programs and bar-code technology for inventory data collection.

Prices start at $20,000, depending on the number of users.

▶ *ProfitKey International*
(603) 898-9800

More new products, *page 116*

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New Products

Candle Corp. has announced DB/Quickcompare for DB2, object management software.

According to the Santa Monica, Calif., company, the product lets users of IBM's DB2 compare and identify differences in their databases and make the necessary changes to synchronize them.

The product automatically correlates DB2 objects with similar characteristics. It can analyze an unlimited number of DB2 databases.

Prices start at $19,500.

▶ *Candle*
(310) 829-5800

Thoroughbred Software International, Inc. has announced Solution-IV 8.3, accounting software for Thoroughbred's IDOL-IV 8.3 Development Environment. The product runs under Unix, Xenix, VMS, AIX and DOS.

According to the Somerset, N.J., company, Solution-IV 8.3 features windowed and colored screens, hot key inquiry capabilities, executive summary information and connectivity to Windows applications.

Prices for Thoroughbred's Solution-IV 8.3 modules range from $995 to $7,495, depending on platform and number of users.

▶ *Thoroughbred Software*
(908) 560-1377

Net400, Inc. has announced Net400/Internet, a gateway for users of Net400's NetMail 400 and IBM's Office Vision 400.

According to the Marietta, Ga., company, Net400/Internet lets users configure IBM AS/400s to be connected over a standard dial connection to the Internet and exchange electronic mail.

Connections can be made with any Internet service provider through Net400's MailConnect 400 SMTP Gateway.

Net400/Internet costs $5,500 or $8,500 bundled with NetMail 400.

▶ *Net400*
(404) 422-1335

Serena International has announced X:Change 1.1.1, a cross-platform file management, file and data transfer environment.

According to the Burlingame, Calif., company, X:Change 1.1.1 lets users upload and download files between mainframe and PC platforms.

It provides a scan facility so users can locate data set members and directory files that contain specific text strings, and it includes a Job Review feature that lets users display and control JES2 and JES3 jobs and output.

The product also provides security features, an application programming interface and the ability to determine and report on the synchronization of files and members located on the same or different platforms, according to the company.

Prices range from $250 to $400 per workstation, depending on the number of users.

▶ *Serena*
(415) 696-1800

Information Builders, Inc. has announced Focus 6.8, a fourth-generation application development language, for Hewlett-Packard Co.'s HP/UX platform.

According to the New York company, Focus 6.8 for HP/UX includes support for large data files and long field names for all relational databases.

Focus databases residing on a mainframe can be consolidated on HP/UX, and data can be warehoused for decision-support access.

The product also features options for developing reports, upgraded security for database administrators and integrated PostScript support for the creation of presentation-quality reports.

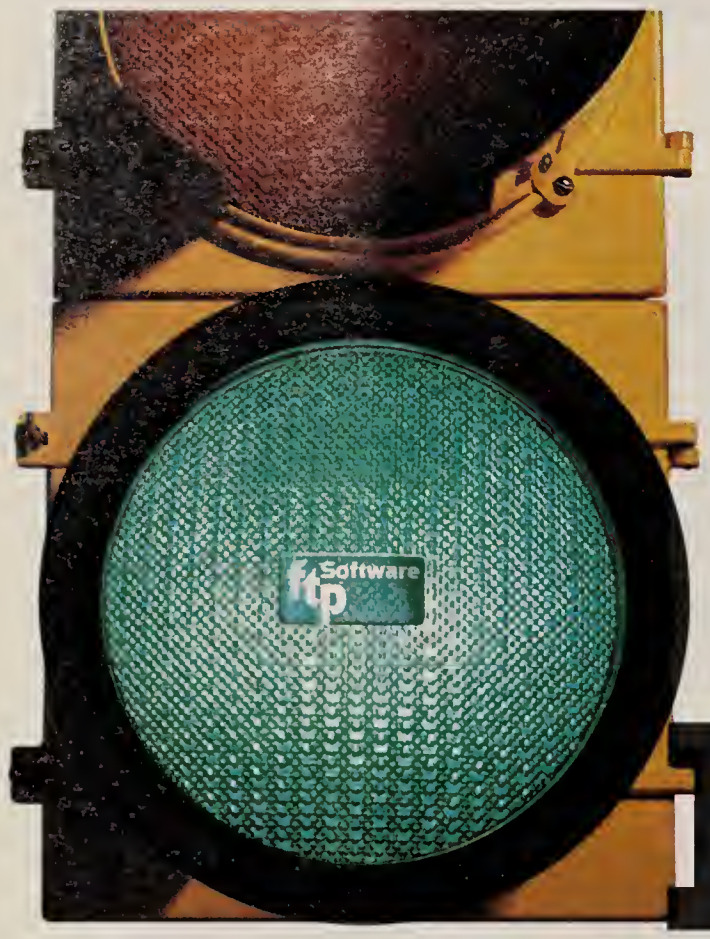
Users can develop reports and graphs through a dictionary of selected fields without accessing any data.

Prices range from $3,000 to $123,000.

▶ *Information Builders*
(212) 736-4433

Product short

JDM Services has announced PCB, a PC-to-IBM AS/400 backup utility. The product provides unattended backup from a PC to an AS/400 disk or tape. Cost: $295 per AS/400. JDM Services, Kansas City, Mo. (816) 822-9305.



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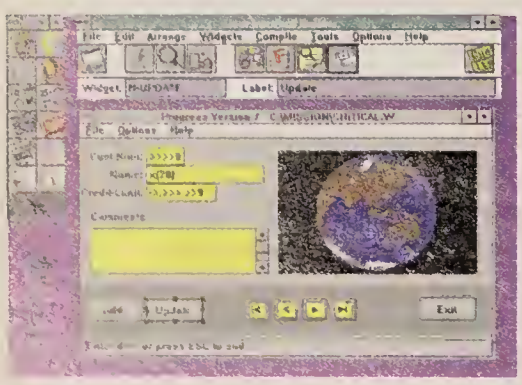
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Next expands, fixes Framework

By Kim S. Nash

Next Computer, Inc. has started shipping its much-anticipated Enterprise Objects Framework, a product designed to let object-oriented applications access, encapsulate and use data stored in relational databases.

Enterprise Objects 1.0 corrects many of the problems of Next's previous database access product, DB Kit, and vastly expands the ability of NextStep developers to get at information in Oracle Corp. and Sybase, Inc. databases, users and analysts said.

Enterprise Objects lets developers and users access advanced database features that DB Kit ignored, such as stored procedures, said Real Forte, director of research and development at Logibec Group Informatique Ltd., a medical software maker in Ile des Soeurs, Quebec.

Version 1.1 in works

Logibec has tested Enterprise Objects against Sybase's System 10 database since April. The product "needs work" in doing rollbacks faster after a database crash or other system interruption, Forte said.

Next plans a quick follow-on to the first release of Enterprise Objects to address such performance concerns. Version 1.1 will run faster than 1.0, said Jacqueline Linder, database produet manager at Next. "In 1.0 we have quality. But 1.1 will have performance," she said, declining to cite specific performance targets. No benchmark results were available from Next or from early users.

Version 1.1 is due to hit beta testing before the end of the year, with general release expected at the end of the first quarter of next year, she said. The upgrade will also support platforms such as Hewlett-Packard Co.'s HP/UX and Sun Microsystems, Inc.'s Solaris, Linder said. Right now, Enterprise Objects supports the NextStep operating system only.

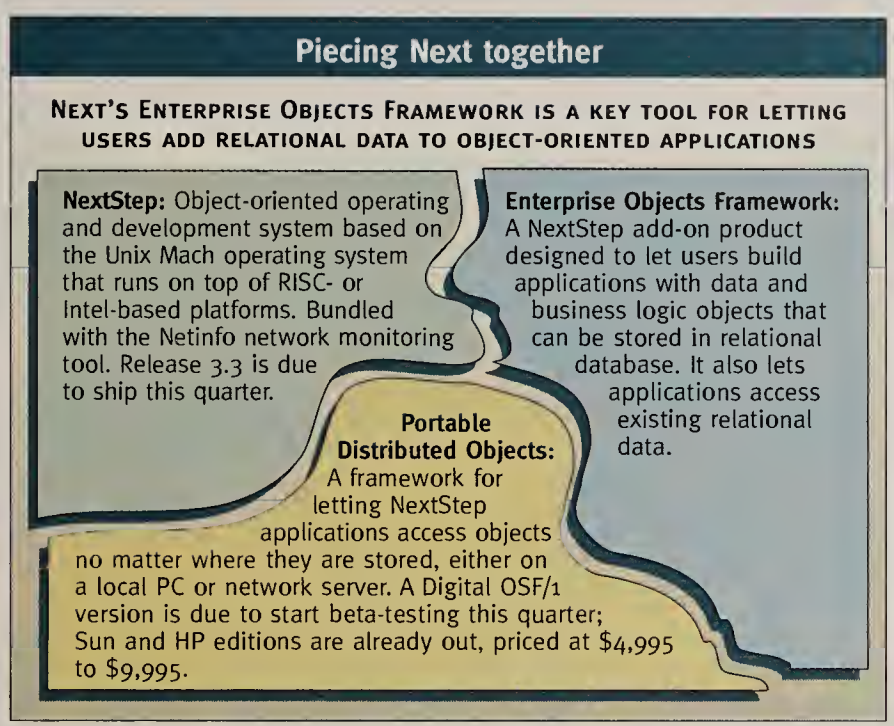
Still, Version 1.0 shows that Next has learned from DB Kit's mistakes, said William Shipley, president of Omni Development, Inc., a NextStep developer in Seattle. "They did the smartest thing any company can do: throw a bad product out and do it again rather than patch, patch, patch," Shipley said.

The product, which is priced at $299 for a single-user license, was designed to sit between PC end users and the NextStep operating system and let users capture data and business rules from Oracle 7, for example. The Framework translates relational structures to object structures and hierarchies and vice versa.

Some object-oriented products can do some of that mapping already, such as ParcPlace Systems, Inc.'s VisualWorks. But that product's foundation in the Smalltalk language limits its ability to integrate with applications written in C, which are what most relational systems are written in, said Hugh Bishop, an analyst at Aberdeen Group in Boston.

Piecing Next together

NEXT'S ENTERPRISE OBJECTS FRAMEWORK IS A KEY TOOL FOR LETTING USERS ADD RELATIONAL DATA TO OBJECT-ORIENTED APPLICATIONS



Meanwhile, Taligent, Inc., a joint venture of IBM and Apple Computer, Inc., "is not a factor," Bishop said. Now 2½ years old, the company has yet to deliver a generally available product, he noted, adding that "market patience is wearing thin."

A Taligent spokeswoman said the company plans to offer a database access framework when the first release of the Tal/Application Environment (Tal/AE) ships in the first half of next year. Although 80% of Tal/AE's targeted 150 frameworks are in pre-beta testing at 100 developer and user sites, "Data Access is one of the ones that we're adding more functionality to in 1.0 . . . so we haven't [described] the features of it yet," the spokeswoman said.

Microsoft Corp. has not stated its intentions regarding access to relational or other types of legacy data for its would-be competitive offering, code-named Cairo.

Nice and stable

Early users of Enterprise Objects were impressed. "It's a remarkably stable product, which is what you want in something that touches your database. You don't want to lose data," Forte said.

On the horizon for Next is integration with object-oriented design and analysis tools, according to Charly Kleissner, Next's director of software engineering. Users doing company-wide re-engineering would be able to model business rules and applications from the top down, using Next tools and design aids that support methodologies from object-oriented gurus Grady Booch or Jim Rumbaugh, for example.

Although such utilities are not in widespread use, "people will need that kind of organized, methodical approach to building object systems" as objects go mainstream, Kleissner said. Next is not likely to endorse one analysis or design product over another.

"Our strategy is to provide hooks to all and any of them," he said.

User training

Powersoft to boost PowerBuilder support

By Rosemary Cafasso

Although training and consulting have been Powersoft Corp.'s top priorities this year, the company reeently acknowledged it could better assist users on the PowerBuilder learning curve.

Based on interviews with several users, the current service record of Powersoft and its consulting partners is mostly good—with a few blemishes. Many users said they have had no problems getting PowerBuilder training, while others said they have struggled to find PowerBuilder expertise.

"I have been developing for about six months, and we haven't gotten any mailings on training," said John Robison, a software engineer at TravelNet, Inc. in Sunnyvale, Calif.

Robison said his company purchased a $5,000 support contract for PowerBuilder Enterprise, and he would like to see more assistance coming from Powersoft such as lists of training courses and lists of partners that provide services.

Adding options

Powersoft said it will continue pushing for improved and increased training and consulting services. However, it does not want to flood the market with personnel who have not had enough time to really learn their craft.

Instead, it will add supplemental training options, including computer-based training and video courses, in the next two months. Earlier this month, it confirmed it would add a "best practices" consulting service to its basic service offerings. The service is intended to give users a jump-start on the big issues of application design and management.

"The demand is definitely out there, and I think it does exceed the supply," said Maria Morrissey, director of education and business services at Powersoft. "I believe we are closing the gap, but it is something of a concern."

Powersoft is not the first client/server company to run into a jam of having a popular product but not enough time to educate trainers and consultants so they can help the growing base of users. SAP America, Inc., one of the leading client/server application companies, has been struggling with this issue for months.

Training

Figures tell all

Powersoft officials said the company and its partners trained 12,000 users in the last quarter, compared with about 15,000 users in all of last year.

Knowledge shortage

"There is definitely a shortage of experts," Bob Culmer, director of information technology at Phillips Cables Ltd in Toronto, said of the PowerBuilder market.

Culmer contracted with a consultant about a year ago to teach his programmers PowerBuilder and work alongside them. Eventually, the consultant joined the staff full time.

"I think I was just lucky to put together the team that I did," Culmer added. "We happened to get some good people."

AI determines customer preference

By Julia King

Hamburgers may outsell fish sandwiches 2-to-1 every third Thursday, but why?

Most large companies regularly conduct customer satisfaction surveys, and the common statistical routines they employ easily yield answers to questions about what customers prefer. But what they don't uncover is why.

This is where Philadelphia-based Pattern Discovery, Inc. comes in. Founded by Steven Hokanson, former manager of an artificial intelligence program at Boeing Computer Services, the firm employs nonlinear analysis techniques based on principles of both AI and fuzzy logic. The idea is to find relationships between different variables, pinpointing those that produce a so-called "halo effect" on customers' overall perceptions.

Making the connections

In the case of a large fast-food company, for instance, restroom cleanliness was shown to have a halo effect on diners' perception of overall food quality.

In another case involving Public Service Gas & Electric Co. in Newark, N.J., nonlinear analysis revealed a direct relationship between billing accuracy and how customers rated the reliability of electric service.

"In other words, if you get your billing right, customers think you're providing better electric service even though you haven't spent a cent," explained Curt Johnson, vice president of business development at Pattern Discovery.

Celtic Life Insurance Co. in Chicago is another company that has employed Pattern Discovery and designed a customer service strategy based on its analysis. Other early users are Roadway Express in Akron, Ohio, Volvo Cars of North America, Inc. in Rockleigh, N.J., and Edmonton Telephone Co. in Canada.

"What their analysis did was hone in on a few things we should address," said Cliff McConville, assistant vice president for marketing services at Celtic Life Insurance. "They were very specific in identifying [customer service] issues that would drive all other issues. What they did for us was something we didn't have the ability to do in-house."

Since it was founded two years ago, Pattern Discovery has operated as a third-party service provider. Now, Hokanson said, the company is developing customized software for clients looking to integrate its analysis techniques with in-place decision-support systems. The plan is to offer a shrink-wrapped package for commercial use, he said.

Analytical methods

So far, Pattern Discovery has analyzed customer survey results for about 25 Fortune 1,000 clients. Companies furnish a copy of their customer satisfaction survey and its results in ASCII format. Then, using a Pentium-based Gateway 2000, Inc. PC and proprietary software written in C++, Pattern Discovery conducts the analysis and prepares a report.

The analytical process is extremely computation-intensive and runs between 10 and 300 hours on a single PC, depending on the size and complexity of the analysis. The software is also written to be run in parallel on multiple machines, which works to reduce runtime. In other words, if an analysis takes 20 hours on one PC, it takes five hours to run concurrently on four different machines.

The cost of analysis varies. The estimated charge for analyzing a 50-question survey with 500 respondents is about $10,000, said Curt Johnson, vice president of business development at Pattern Discovery. — *Julia King*



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Expert system modernizes Kaiser

By Melinda-Carol Ballou

An expert system-based application has helped Kaiser Foundation Health Plan, Inc. journey "from the 19th century to the 21st century," said Ila Sullivan, manager of special enrollments.

Sullivan's group, based in Oakland, Calif., evaluates individual Kaiser applicants to determine whether they medically qualify for membership. Prior to the development of an expert system application to help manage this process, the group handled all information manually.

For example, Sullivan wrote information on scratch pads, and other employees transferred that data onto index cards. All told, there were "something like 15 handoffs from start to finish" during the process of putting together applicant data, according to Sullivan. Every application had to be reviewed by medical staffers. Processing applications could take four to six weeks.

Enter Joe Yuson, a project manager at Kaiser Permanente Northern California based in Walnut Creek. Because Kaiser was already a shop that used Texas Instruments, Inc.'s Information Engineering Facility, Yuson and his staff evaluated the Oakland site's requirements and did a business area analysis a year ago.



Kaiser's Ila Sullivan: *Before the expert system, information was handled manually*

"There were two primary issues: customer satisfaction and improving turnaround time, and redeploying and redeveloping insurance applications to meet the needs for the next decade or two," Yuson said. "This particular area had zero automation."

His group redesigned some of the business processes to reduce the number of handoffs, and it purchased Trinzic Corp.'s Aion Development System (DS) rules-based development tools. Aion DS lets the developers codify the rules the medical staffers use when they review client applications.

More flexibility

Dubbed System for Individual Marketing and Review (SIMR), the system has cut in half the amount of time a doctor needs to review applications, Yuson said. Aion DS also allows users to maintain their own rules so that, for example, if they want to change the number of cigarette packs allowed in one year or if they feel a rule relating height to weight is too restrictive for prospective members, they can change it, according to Yuson.

SIMR now handles about 80% of individual applications to Kaiser, with approximately 28% immediate acceptances and 12% immediate rejections that do not require medical review. Applications with immediate responses are turned around in two days; those requiring medical review take two to three weeks.

ON SITE

Kaiser Foundation Health Plan, Inc.
Oakland, Calif.

Challenge: To migrate from a cumbersome, time-consuming, manual process for insurance applications to an automated system.

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New Products

James Martin & Co. has announced Architect, an integrated suite of application development products.

According to the Reston, Va., company, Architect includes the flagship product, also called Architect, which captures, automates and controls the application development process.

Separate methodologies in the product line include The Client/Server Methodology, The Systems Redevelopment Methodology and IE-Expert, which share a common design to increase the consistency of content and integration. The products run under Microsoft Corp.'s Multimedia Viewer.

Apprentice is the interactive learning component of Architect that provides training on development techniques for the desktop.

Prices start at $2,500 per user, and each methodology starts at $1,000.

▶ *James Martin*
(703) 620-9504

Intelligent Environments, Inc. has announced AM/Impact, a graphical presentation tool kit.

According to the Tewksbury, Mass., firm, AM/Impact lets developers create, display, manipulate and print complex forms, including logos, graphics, pictures, geographic sectors, animation and illustrations.

Users can create multipage word-wrapped text documents, draw text strings without word wraps and load and scale graphics files. A display feature lets users zoom in or out of images.

AM/Impact costs $995.

▶ *Intelligent Environments*
(508) 640-1080

Data Discovery, Inc. has announced Data Detective, multiple-agent information retrieval software.

According to the Overland Park, Kan., company, Data Detective lets users find information across multiple data systems, formats and media. The product is recursive and acts as an overseer of inquiries, using a family of agents, called Informers, to find information.

Prices start at $25,000 for Data Detective and $5,000 for each agent.

▶ *Data Discovery*
(913) 339-4378

PowerBasic, Inc. has announced the PowerBasic Developer Kit for Windows.

According to the Carmel, Calif., company, the PowerBasic Developer Kit for Windows lets users move DOS programs to Windows through procedural programming, event-driven methods or a combination of both.

Features include the ability to run multiple programs concurrently with preemptive multitasking and the ability to link industry-standard object modules and Dynamic Link Libraries.

The PowerBasic Developer Kit for Windows costs $149 as an upgrade or comes as part of PowerBasic Pro for $299, which includes the PowerBasic 3.0 compiler.

▶ *PowerBasic*
(408) 659-8000

KL Group, Inc. has announced XRT/graph 2.4, a two-dimensional graphing widget for X Window System/Motif.

According to the Toronto company, XRT/graph 2.4 features zooming, rotating and scaling capabilities, axis controls and support for missing values.

A graphical prototyping and code development tool lets users interactively define and view graphs and outputs C code and resource files.

XRT/graph 2.4 costs $1,995 for a single user and $7,995 for a network license.

▶ *KL Group*
(416) 594-1026

Liant Software Corp. has announced RM/Cobol Version 6, a software development environment for transitioning legacy data and applications to client/server systems.

According to the Framingham, Mass., company, RM/Cobol Version 6 provides a suite of compatible tools for report writing, presentation, data management and data access. The product suite incorporates on-screen windowing, 32-bit memory support and access to Dynamic Link Libraries.

Prices start at $1,295, depending on the platform.

▶ *Liant Software*
(508) 872-8700

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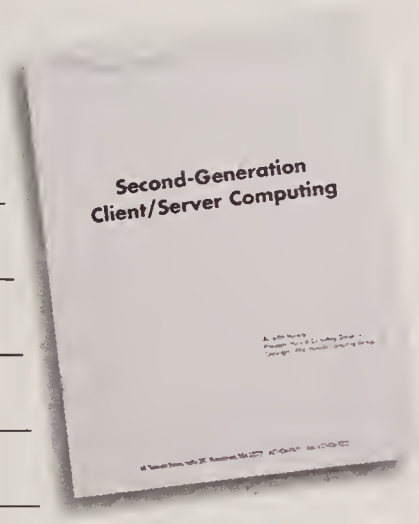
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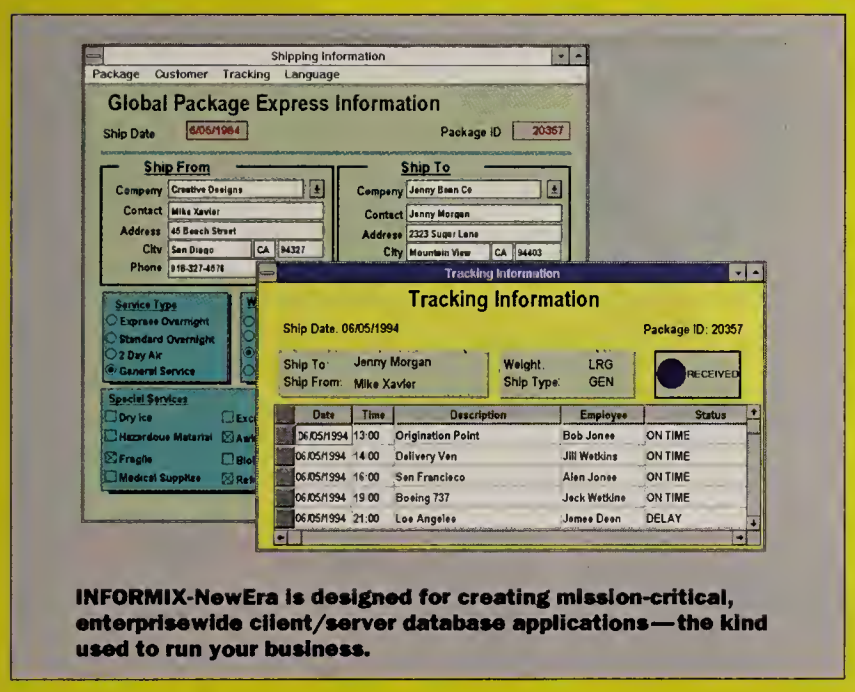
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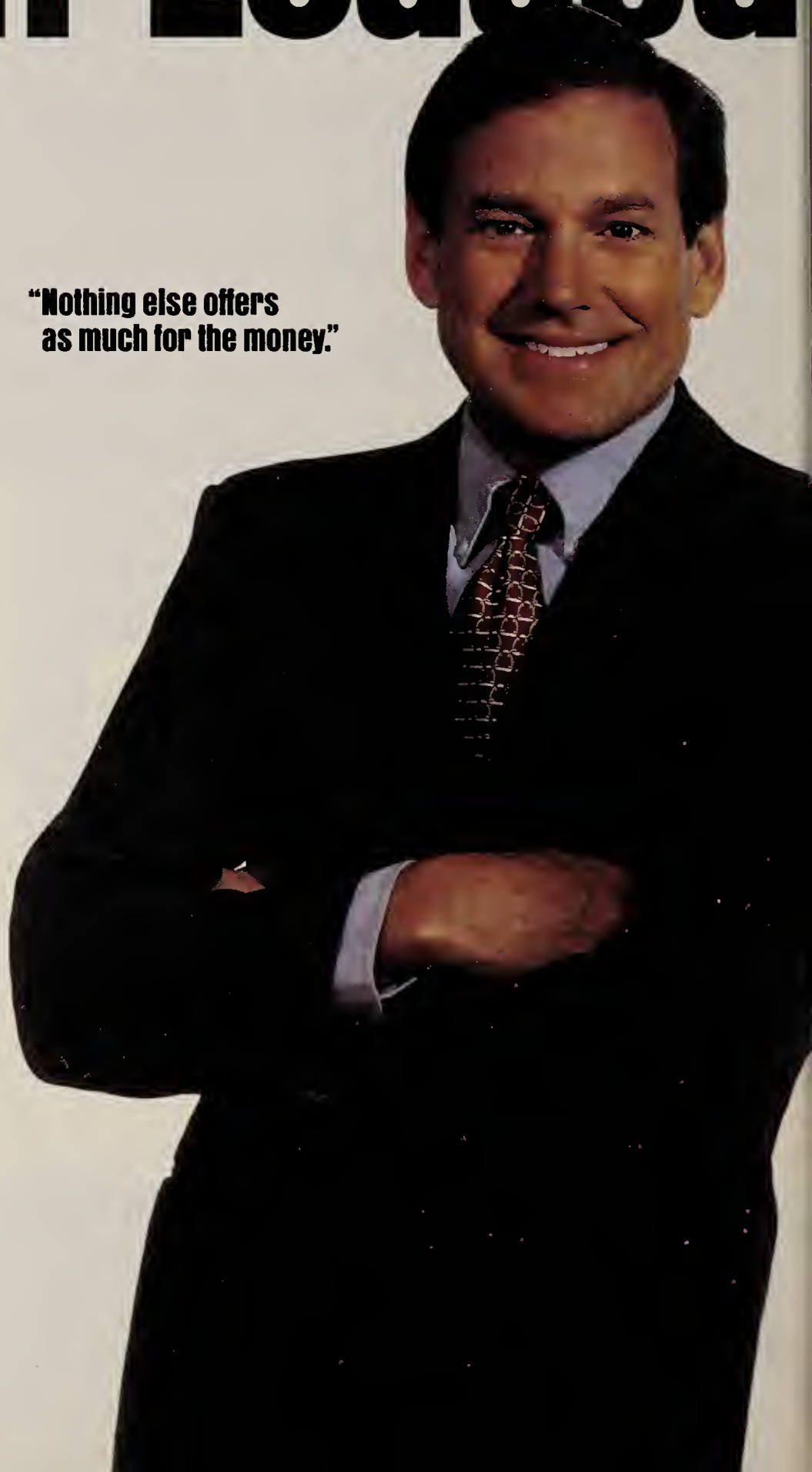
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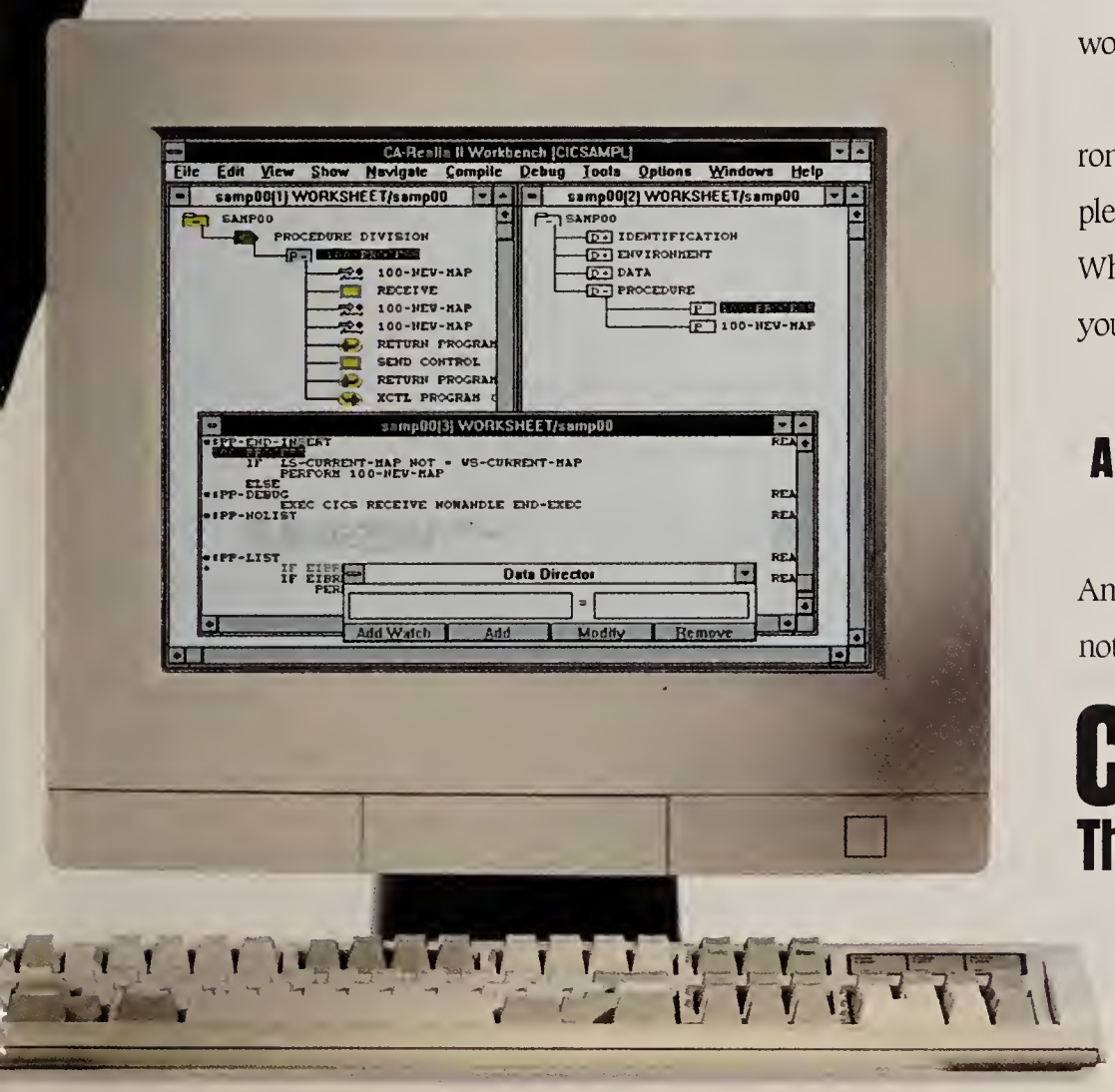
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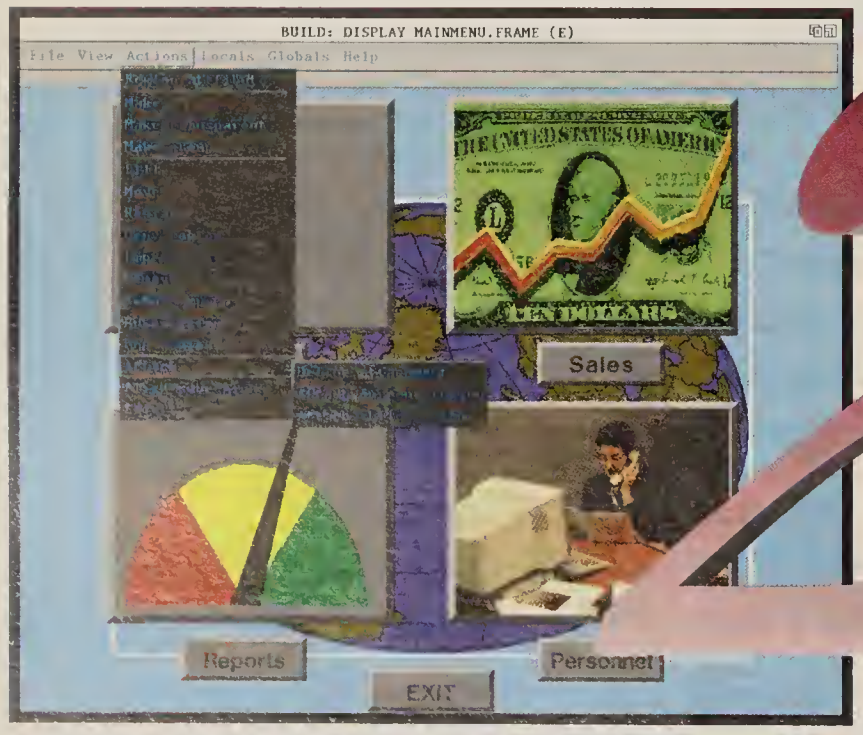
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CALENDAR, *page 134*

Consumer products marketing managers, up to their chins in scanner data, are growing impatient with their decision-support systems. What can IS do to keep . . .

Delighting the marketer?

BY BRIAN McWILLIAMS



GORDON ARMSTRONG (left) *and* **JIM LABELLE:** *Teaming marketing and information systems at Ocean Spray*

PHOTOGRAPHY BY STEPHEN SHERMAN

If Jim Labelle could tear himself away from his spreadsheet, he might enjoy watching the cranberry harvest under way in a flooded bog just outside his office.

But Labelle, an assistant brand manager at Ocean Spray Cranberries, Inc.'s headquarters in Lakeville, Mass., is occupied with a different kind of harvest. As the all-important holiday season draws near, he and his marketing colleagues must wade through a sea of data on sales, shipments and spending — and make snap decisions on the four P's of marketing: promotion, pricing, placement and product mix.

Marketer, *page 130*

Marketer

CONTINUED FROM PAGE 129

While some marketers seldom even power-on their desktop PCs, a new breed of computer-savvy marketing managers like Labelle is sweeping into the consumer packaged-goods industry. These are quantitative jocks, mostly thirty-something MBA graduates, who are not afraid to test their marketing hypotheses rigorously with regression analysis.

"Some people think we spend all our time doing creative stuff like reviewing ad copy," Labelle says, "but I'm basically a number cruncher. My mind is on things like, 'What was our incremental lift from that promotion we ran in Buffalo last month?'"



"Too often, the market research organization buys some data, IS loads it, creates [a marketing decision-support system], provides some training and then walks away. IS needs to stick around and make sure people are getting value out of those systems."

GORDON ARMSTRONG, MARKETING SCIENTIST, OCEAN SPRAY CRANBERRIES, LAKEVILLE, MASS.

To assist this important group of users, corporate information systems groups are busy building a new generation of marketing decision-support systems — along with databases that integrate gigabytes of syndicated scanner data with internal information on costs, shipments and consumers. According to Howard Dresner, a research director at Gartner Group, Inc., "business-intelligence systems for marketing are one of the hottest application areas today. They're the Holy Grail for marketing-driven companies."

Knowing the customer

Unfortunately, a lot of these systems are being developed by IS people who don't have a clue about what marketers do for a living, says Robert Blattberg, a professor of retailing at Northwestern University's Kellogg School of Management.

"Many IS groups don't understand how marketing people make decisions. And it doesn't do any good to ask them what kind of software they need. They'll tell you they don't know," Blattberg says.

Merely automating the way product managers work won't cut it either, says Eric Deaton, director of modeling and forecasting in the marketing information department at Coke Foods in Houston.

"The IS development methods focus on asking users questions like, 'What prevents you from finishing your job by five o'clock?' IS needs to start asking better questions that will help companies reengineer marketing," Deaton says. His advice: Rethink what you do altogether rather than just how you can do it faster.

The marketing science revolution

Clearly, the world of product marketing has changed dramatically in recent years, and systems must change with it, says Daniel Leemon, vice president at Boston Consulting Group in San Francisco.

"Product managers used to be able to say, 'Here's the product, and here's the commercial.' But consumer markets and communications have become so fragmented that delivering the value of the brand is much more complex," Leemon says.

The historic power shift from manufacturer to retailer — as evidenced by the rise of private-label brands — also forces manufacturers to hustle harder for store shelf space. No longer able to play the bully, marketing and sales teams are adopting "fact-based" selling to demonstrate why their products will lead to greater retail profits.

"We have to know more about our customers' business than our customers do," says Mark Arciuolo, a paper category specialist at James River Corp. in Wilton, Conn.

Life in the age of marketing science can be downright stressful, says Rob Stevens, a brand manager in the hot cereals group at Chicago-based Quaker Oats Co. He admits he often works late at the office and brings work home on his laptop. "Having all this information available definitely holds you to a higher level of accountability. But it still takes a lot of effort to try to figure out what's driving the business," Stevens says.

Stevens' frustration is typical, says David K. Goldstein, a principal at Knowledge Management Associates in Burlington, Mass. Even the most quantitative marketers are overwhelmed by the amount of data available. "They know there's a story somewhere in the numbers, but they're having a hard time finding it," he says.

Gordon Armstrong, a marketing scientist at Ocean Spray who serves as a liaison between marketing and IS, says corporate IS groups are partly to blame.

"Too often the market research organization buys some data, IS loads it, creates a [marketing decision-support system], provides some training and then walks away," Armstrong says. "IS needs to stick around and make sure people are getting value out of those systems."

And it's not just the quantity of data that gives product managers heartburn; it's also the poor quality. Stevens says he is lucky enough to have financial analysts who regularly sort through A. C. Nielsen consumer sales and store audit data for him. They use Nielsen's ScanFact and ScanProMonitor to spot trends and problems that require Stevens' attention.

But "scanner data that's been aggregated to the national level doesn't really help me understand whether it's a retail display that's driving the business at an account vs. a price point or an ad feature," Stevens complains.

Marketing managers universally crave what they call actionable data — information presented in a way that facilitates decision-making, according to John M. McCann, a professor of marketing at Duke University's Fuqua School of Business in Durham, N.C.

"Marketing occurs where products and messages come together with people — in the aisle of the supermarket or at home in front of the TV. You get better by improving your delivery at those points of action," he says.

That's why many marketers today are asking for even more detailed data, as if they weren't burdened enough. Steven Petitpas, a brand manager in Quaker's cold cereals group, says he believes having more access to store-level scanner data would give him an edge in micromarketing. "We need to be on top of that data or somebody else might be," he says.

Marketer, *page 133*

Colocating with Cap'n Crunch

Like other marketers in the consumer packaged goods industry, Steve Petitpas, brand manager for Quaker Oats' Cap'n Crunch cereal, could use a technological breakthrough right about now.

Petitpas' wish tops the lists of many marketers: "I need a tool that puts scanner data into a format I can use," he says.

Unfortunately, the corporate IS group at Quaker has not always been his first stop for such solutions, Petitpas says. "For a while, we were asking them to do things they just didn't know how to do."

Jim LeGere, Quaker's vice president of IS, half agrees: "When you don't have good alignment between the business and IS, users ask for something that isn't exactly what they need, even if they think it's what they need."

As a result of these miscommunications, Petitpas and his fellow marketers sometimes looked to outside consultants for key enabling technologies. That may change now that Quaker IS has put business information teams in each division, working elbow to elbow with users.

A team consists of about six developers, led by a business director with broad-based business and technology skills, LeGere says. "IS organizations traditionally haven't understood the business requirements of marketing," he says, "so we felt it was important to get alignment not from paper strategy but from people being immersed in the business activity."

According to Petitpas, since the information team moved in, the improvement in service has been "tremendous. Now they're getting used to the questions, and we're getting a lot better at asking them."

PRODUCT MANAGERS ARE DROWNING IN DATA

The amount of time product managers spend trying to make sense of millions of pieces of data increases as they get closer to the actual marketplace. Consider the following typical time allocation on data interpretation and the amount of data available for various functions.

Percentage of time spent working with numbers	
80%	Assistant brand manager (tracks promotions)
40%	Associate brand manager
20%	Brand manager (sets strategies)

Data volume by type of data *(in individual pieces)*	
1M	Store audit data of sample products
10M	Warehouse withdrawal data as a means of tracking product demand activity
300M	Market-level scanner data to track sales by region
500M	Chain-level scanner data to track sales for an entire chain
10,000M	Store-level scanner data to track sales at each store in the chain

Source: *The Marketing Information Revolution*, Robert Blattberg, et al, editors, Harvard Business School Press, 1994

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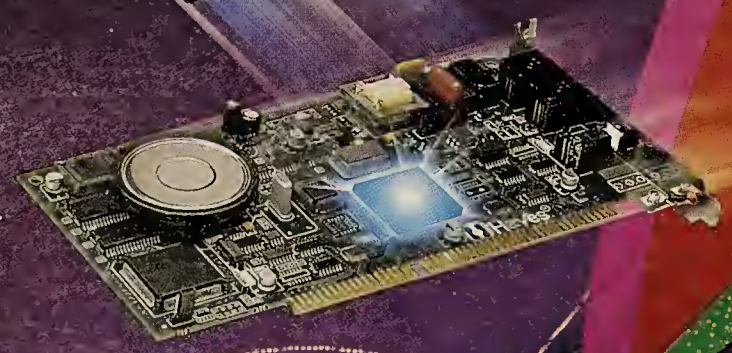
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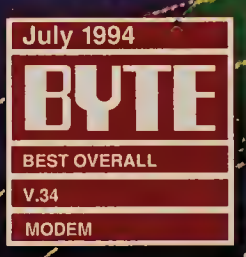














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Marketer

CONTINUED FROM PAGE 130

But discerning causal relationships will remain difficult until someone resolves the mismatch between data quantity and software quality, he says. "Right now we can't do everything we want because it takes a lot of time to pull the data out of a database, rearrange it, get it into Excel and play around with it. We need a breakthrough so that the system is more selective," Petitpas says.

Such an automated data screening capability is also Arciuolo's wish. His job involves working with James River's retail customers to help them better manage the paper towels, napkins and bath tissue on their shelves.

Can we talk?

The marketing and IS departments need to communicate better with each other, according to a survey of senior human resource executives at large companies

59% say cross-functional communication between marketing and IS is very important

61% say current communication is poor

Results of 1994 survey by Boston Consulting Group, San Francisco

"We earned that business by being tops at delivering actionable data on the local level," he says. Yet Arciuolo gripes that 80% of his time at the computer is spent manipulating data, and 20% is spent analyzing it. "It should be the other way around. The computer should somehow be doing the manipulation so I can go right into analysis," he says.

Aggregating understanding

Duke University's McCann says he believes that the practice of "drilling down" through gigabytes of national-level scanner data is where many marketing decision-support systems go wrong.

"Marketers need to aggregate their understanding, not their data," McCann says. "The value of information comes from looking at very fine levels of detail and seeing what you can learn at the point of action to improve yourself. Then you have to do that every week for every retailer and for every brand item that you have. That's where the power of the computer comes in."

One firm that has bought into this iterative approach is Ocean Spray. According to Armstrong, the company used prototypes developed by McCann to create a spreadsheet-based intelligent agent that automates the repetitive task of assessing and reporting the impact of promotions.

James River is testing a proprietary system of its own. The system would automatically create plans for category managers, according to project manager John Pekala, manager of strategic category development at the company's Norwalk, Conn., office.

Arciuolo reports that he and fellow category managers are delighted with the system's point-and-click simplicity and Pekala's responsiveness to their needs.

"Some IS types can't think outside the box, but John has helped us crunch through some of these numbers, so he knows the pain and agony," Arciuolo says.

Such liaisons between marketing and IS, while rare, are the only way to go, Northwestern's Blattberg says. "If I were running an IS department, I'd spin off marketing and sales technology as a separate organization," he says.

Unfortunately for marketers everywhere, the pressure on them will only intensify in the future, according to Boston Consulting Group's Leemon. "To deliver the brand promise, companies will need to get all their functions aligned, from marketing through logistics," he says.

IS can build the information bridges that make this possible, Leemon says, and the most important link may be the one between it and marketing.

McWilliams is a free-lance writer in Durham, N.H.

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Intelligence Files

Retailers relying on IS

Leading national retailers are putting more stock in the ability of information systems to help lower product costs and differentiate their service and value from competitors. That is the conclusion of a new survey from CSC Consulting Group in Waltham, Mass., which polled 366 midlevel and senior IS executives in retail organizations.

The survey concluded that consumers are becoming more value-oriented and increasingly disloyal to individual retailers. As a result, says Claire Parker, a vice president at CSC Index, Inc., "technologies that enable retailers to differentiate their value offerings from the competition clearly are gaining momentum."

According to respondents, the following are the most critical IS activities or strategies in the retail industry:

- Integrating systems.
- Improving systems development.
- Re-engineering business processes.
- Capitalizing on advances in information technology.
- Developing a strategic IS plan.

The top technologies being implemented this year include the following: executive information systems, client/server architectures, electronic data interchange, imaging, radio frequency warehouse devices and document/workflow management.

The hottest technology areas for the next three years are the following: quick response, continuous replenishment, labor scheduling, automatic replenishment and frequent shopper programs.

Source: "The Customer Rules: Consumer Demand for Value Drives Technology Decisions," CSC Consulting's Fourth Annual Study, Waltham, Mass.

Women closing salary gap

Female technical writers and editors now earn nearly the same as their male counterparts.

According to a survey of 800 members of the Society for Technical Communication in Arlington, Va., female technical writers and editors earn 98% of what male writers and editors earn. This represents a steady increase in salary levels over the past 10 years, up from 85% in 1985 and 94% in 1990.

On average, female technical writers and editors now earn $40,000 annually, compared with $41,000 for men. Women now hold approximately 50% of midlevel and senior management positions and make up more than half the estimated 100,000 technical communications professionals nationwide.

IS budgets target customers

Fortune 1,000 companies will continue to increase their spending on IS in the next few years, but the added dollars will go toward customer connections, not internal systems.

That is the finding of a new survey of 35 Fortune 1,000 companies by Forrester Research, Inc. in Cambridge, Mass. The survey reports that the "new customer connection" of interacting directly with customers electronically will change technology investment plans for large organizations.

Forrester reports that Fortune 1,000 companies currently spend only about 10% of their IS budgets on customer connections, but that number will increase to nearly 50% by the year 2002. Those same companies will double the percentage of their total corporate budgets spent on IS during that period, the report says.

Waverly Deutsch, author of the report, says, "Connecting with customers electronically means that MIS must support thousands of new users, and these systems have to be rock solid and fun to use. Customers will not be patient if the network is down, and they will not invest a lot of time learning how to use these applications."

The good news for chief information officers? "Systems that improve customer service will tie [information technology] spending directly to the profit of the company. This new focus will raise the CIO's stature and make it far easier to justify new investments," Deutsch says.

IS spared downsizing wrath

Meanwhile, another report from Computer Economics in Carlsbad, Calif., says the corporate rush to downsize in recent years has not had dramatic impact on IS spending, and a majority of companies surveyed increased their IS budgets by at least 25% between 1993 and 1994.

The same report found that spending on mainframe systems is down 49% this year, while spending on PCs is up 35% from the previous year.

Calendar

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Sixth Annual Open Systems World/Fed Unix '94. Washington, Nov. 28-Dec. 2 — Conference sessions include Federal Open Systems, Motif/COSE International Users, Novell, Inc. AppWare Developers, Santa Cruz Operation Interoperability, Solaris Developers, Windows NT Developers, Linux International Users/Developers and World-Wide Web/Mosaic Users. Contact: Open Systems World, Inc., Laurel, Md. (301) 953-9600.

New York Virtual Reality Expo '94. New York, Nov. 29 — Contact: Schwartz Public Relations Associates, Inc., New York, N.Y. (212) 677-8700.

Mobile World: Improving Business Productivity Through Mobile Computing. Boston, Nov. 29-Dec. 1 — Topics: Cellular/wireless communications, mobile and pen application development and integration, business automation and corporate management, mobile and electronic mail-enabled technologies. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

The Field and Sales Force Automation Conference. Boston, Nov. 29-Dec. 1 — Topics: Platforms for corporate headquarters, connectivity options, field access technologies, sales impact and corporate management. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Cause '94: The Annual Conference for Managers and Users of Information Technology in Higher Education. Orlando, Fla., Nov. 29-Dec. 2 — Contact: Cause, Boulder, Colo. (303) 449-4430.

DEC. 4-DEC. 10

BGS Systems Users Group Meeting. Orlando, [illegible] Dec. 4 — Topics: Visualizing multiple systems, subsystems and networks, BGS process and products for managing distributed Unix systems and real-time management. Contact: BGS Systems, Wellesley, Mass. (617) 891-0000.

Developing an Outsourcing Strategy: Balancing Internal vs. External Sourcing. Boston, Dec. 5-6 — Charles Anslay, vice president of Integrated Systems Solutions Corp., will speak on "The Information Technology Outsourcing Industry — Its Dynamics," and Benny Popek, director of Coopers & Lybrand, will discuss "Directions and Transitional Outsourcing Strategy for the '90s." Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

IT Services '94: The Information Technology Services and Support Conference and Exposition. Santa Clara, Calif., Dec. 5-7 — Contact: Creative Expos and Conferences, Inc., Walpole, Mass. (508) 660-7099.

DB/Expo '94. New York, Dec. 5-9 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Wireless Datacomm Fall '94 Exposition and Conference. Washington, Dec. 6-8 — Admission: $495 for a one-day session, $895 for two days or $1,095 for three days. Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

Fall Internet World '94. Washington, Dec. 6-9 — James Clark, chairman and chief executive officer of Mosaic Communications, Inc., will give the keynote address, "The Internet IS the Information Highway." Fees: $445 if registering before Nov. 22, $495 after Nov. 22. Contact: Mecklermedia, Westport, Conn. (203) 226-6967.

Database & Client/Server World. Chicago, Dec. 7-9 — Conference will run in conjunction with the 5th Annual Rdb World, the EDA Solutions Summit, the RM25 Silver Anniversary Conference and the Executive Client/Server Conference. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

The National Center for Database Marketing. Stamford, Conn., Dec. 7-9 — Also being held Dec. 8-10 in Orlando, Fla. Contact: Margaret Launnzel-Pennes, National Center for Database Marketing, Stamford, Conn. (203) 358-9900.

DEC. 11-DEC. 17

Shaping Government for the 21st Century. Phoenix, Dec. 11-14 — The symposium will focus on how to improve the delivery of public services and explore new ways to respond to the public's increasing demands. Topics will include roles of the citizen. Keynote speaker is Peter Senge, author of *The Fifth Discipline: The Art and Practice of the Learning Organizations* and *The Fifth Discipline Fieldbook*, will discuss the importance of organizational learning to ongoing success. Contact: City of Phoenix, Phoenix, Ariz. (602) 262-4714.

Project World Conference & Exposition. Santa Clara, Calif., Dec. 12-16 — There will be 12 preconference workshops, including programs by the Tom Peters Group and Deloitte & Touche; five keynote sessions, featuring the latest discoveries in technology — leadership and implementation strategies; 114 expert presenters, more than 80 exhibit booths highlighting the latest in project management groupware and software and consulting and training. Two-day admission to exhibits and keynote addresses is $25. Contact: Center For Management Research, Wellesley, Mass. (617) 431-9797.

SIM videocast looks at NII issues

Development of the information superhighway will be the subject of a nationwide industry videoconference on Thursday, Nov. 17. The videoconference is being sponsored by the Society for Information Management (SIM) and will feature presentations by Steve Ballmer from Microsoft Corp., Warren McFarlan from the Harvard Business School, Steven Jobs from Next Computer, Inc., Esther Dyson from Edventure Holdings, Inc. and Craig McCaw from McCaw Cellular Communications, Inc.

The videocast will originate from the Pacific Bell auditorium in San Ramon, Calif., with more than 1,000 IS executives expected to attend. SIM chapter audiences in Boston and Seattle will participate in the videoconference in real time via satellite-based audio/video links. Additional SIM chapters will participate as video locations in Washington, Hartford, Dallas, Detroit, Salt Lake City, Minneapolis, New York, Cleveland, San Francisco and Milwaukee.

Issues to be addressed will include the National Information Infrastructure (NII), including time frames, participants and costs, the impact of NII on business, how the NII relates to IS organizations, how the NII affects the perceptions and requirements of IS users, how IS leaders will use the NII and what the NII allows users to accomplish.

For information on the videoconference, call the SIM NII seminar information line at (415) 634-7SIM.

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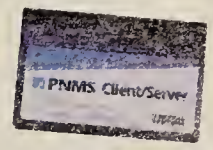
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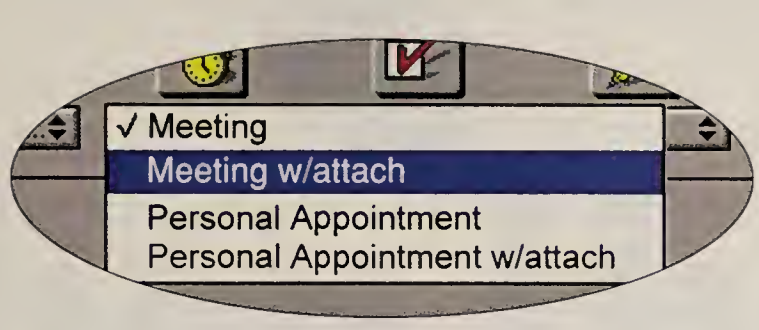
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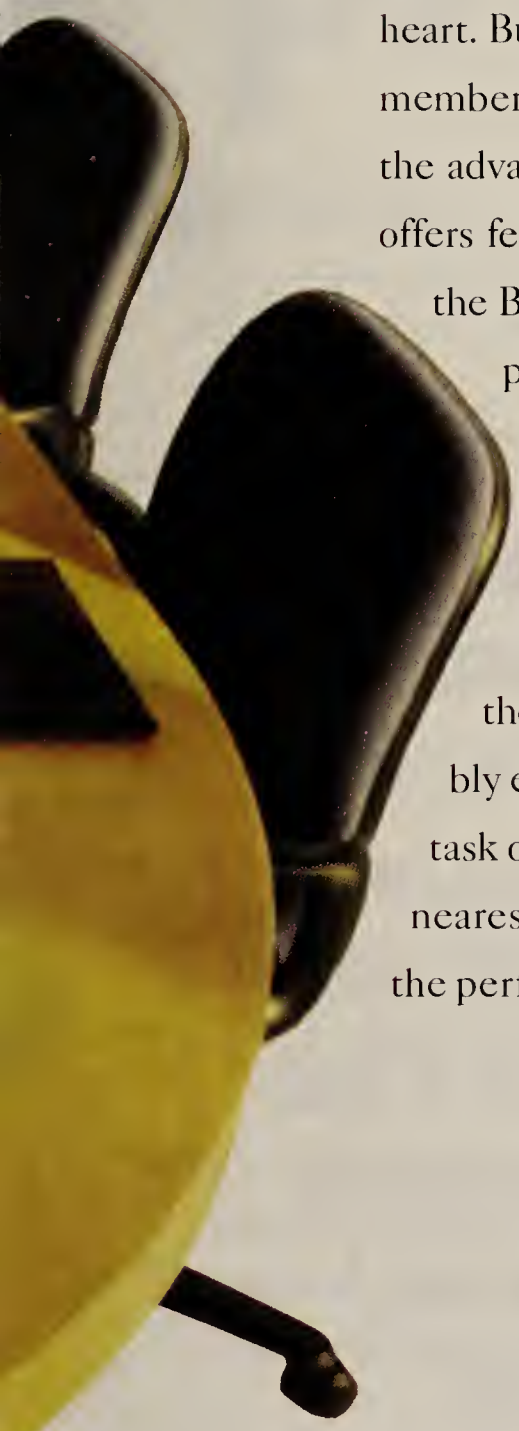
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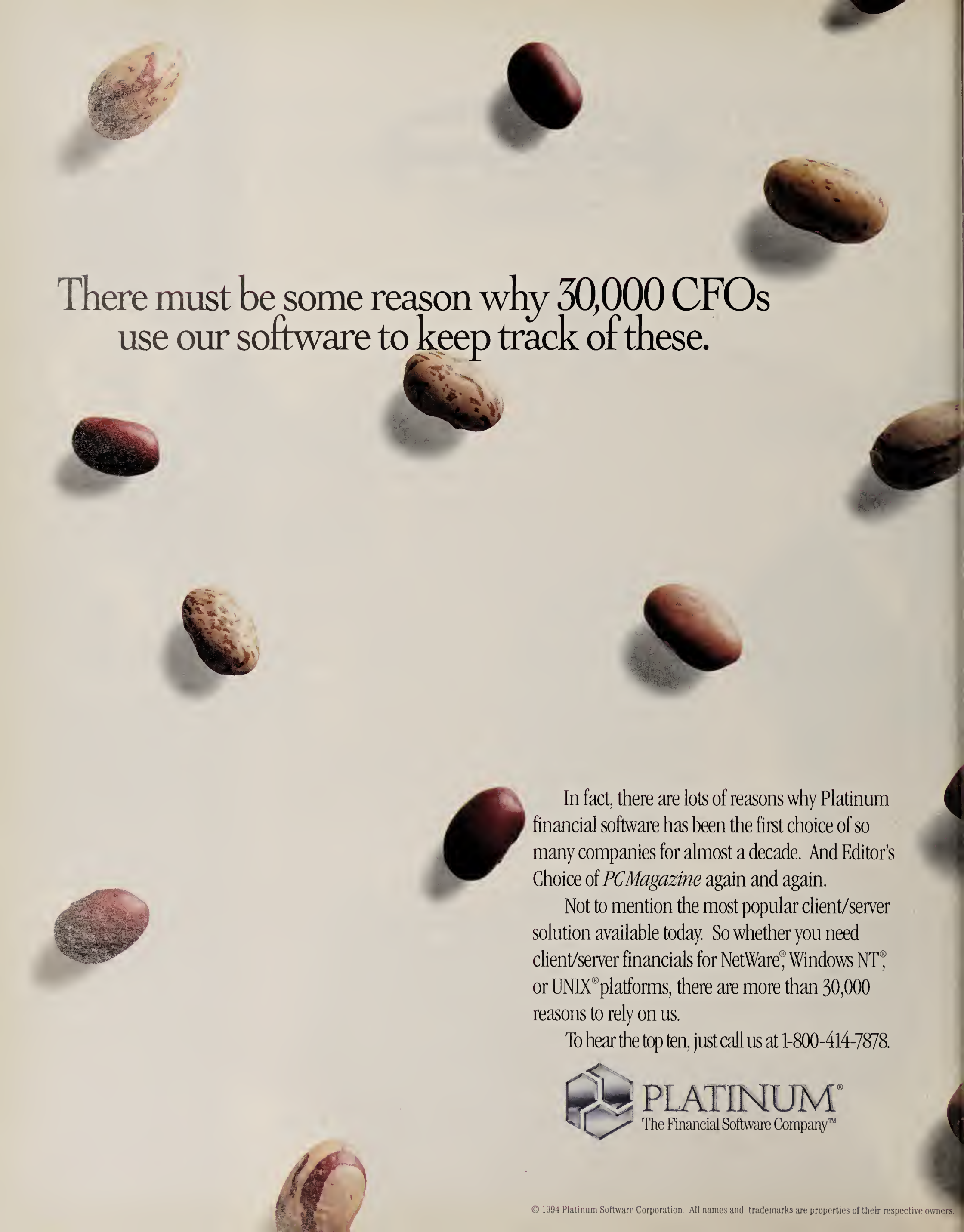
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When the PC price is right

By Cheryl Gerber

If you walk the aisles of Comdex/Fall '94 and listen to leading PC vendors, you could get the impression that your company is in imminent peril of falling behind the technology curve if you don't buy a high-end PC containing Intel Corp.'s Pentium, IBM et al's PowerPC or Digital Equipment Corp.'s Alpha chip.

The truth is, turning away from such siren calls will put you in good company rather than in the dustbin of technology obsolescence. PC users interviewed by *Computerworld* recently said the hot PC chip of the moment is still Intel's 3-year-old I486.

Desktop PCs, *page 141*

While some users don't see a need for Pentiums, others are waiting for the right price/performance point to make their buys



SUSAN BLUBAUGH

COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

BUYERS' SATISFACTION SCORECARD:

Pentiums from Compaq, Dell, Gateway and IBM receive high ratings from 200 early users. Page 142

FIRING LINE

FIRING LINE:

Apple's high-end Power Macintosh 8100 scores high satisfaction marks in running native applications but is pricey compared with the rest of the line. Page 146

LAB TEST

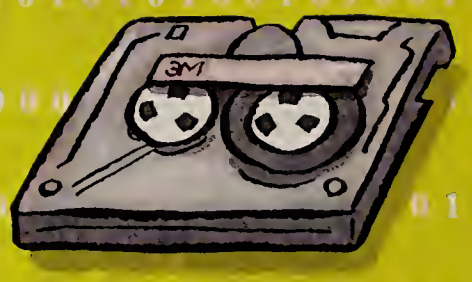
LAB TEST:

In an independent speed comparison, Intel's I486 chip is left in the dust by PCs with Pentium, Alpha and MIPS processors. Page 149

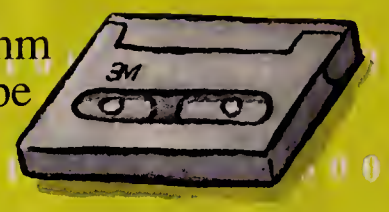
PRODUCT REVIEWS:

90-MHz Pentiums: AST's Premmia GX, HP's Vectra XU, Micron's P90PCI Powerstation, Polywell's Poly 586-90VL and Zeos' Pantera 90 receive high marks from PC reviewers. Page 152

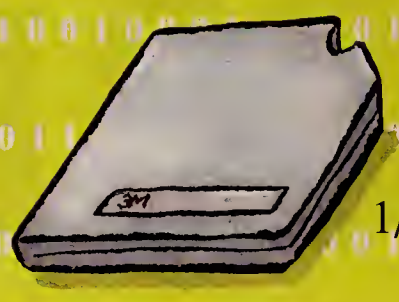
The path to follow whichever storage option you choose.



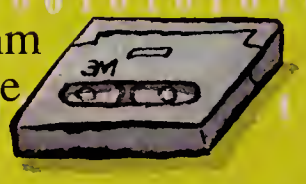
5 GB – Magnus™
Data Cartridge



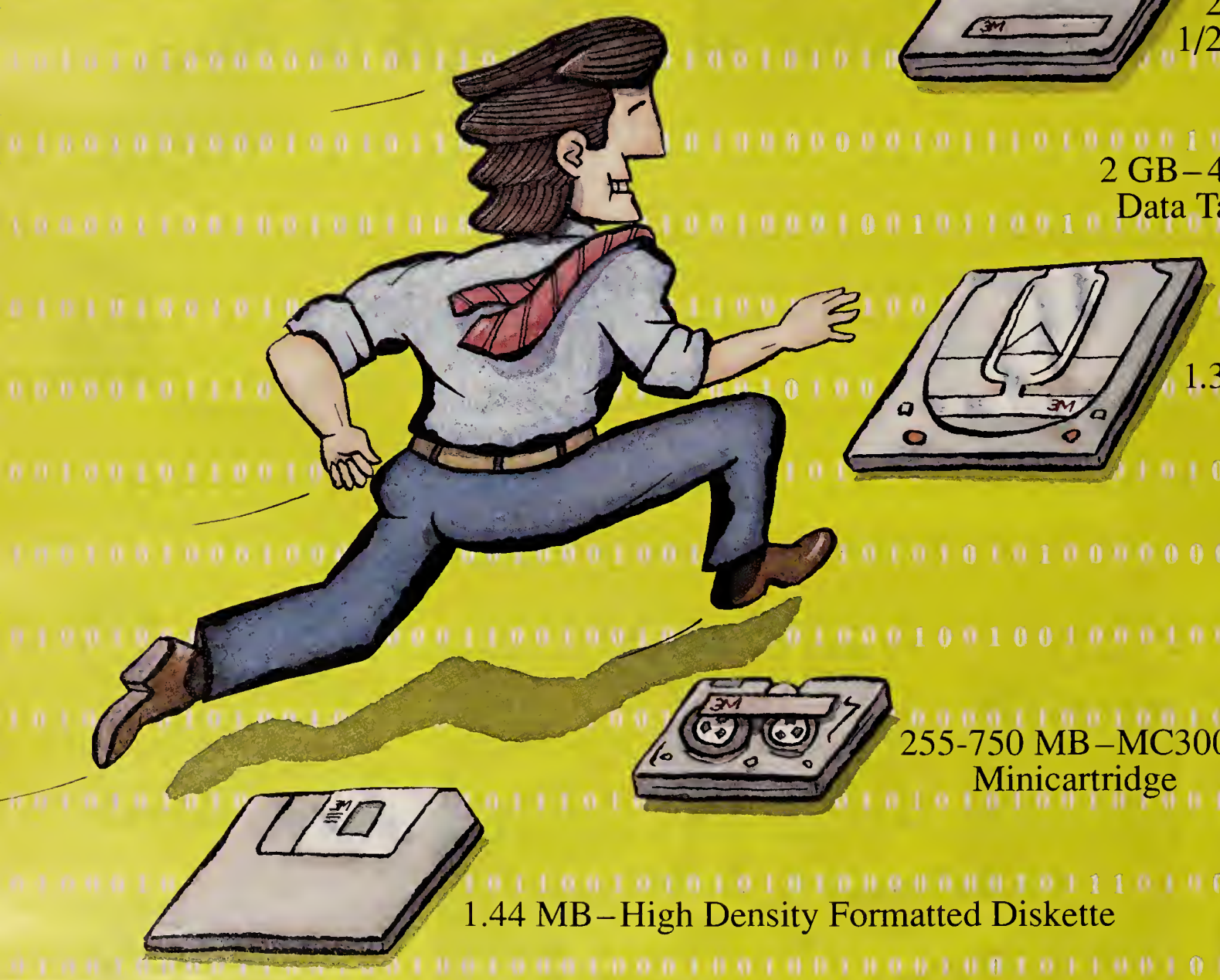
5 GB – 8mm
Data Tape



2.4 GB – ECart™
1/2" Tape Cartridge



2 GB – 4mm
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3M *Reliability*

Desktop PCs

CONTINUED FROM PAGE 139

"It's not necessary to go to Pentium. You couldn't use the processing power if you had it. Why not just add hard disk space or RAM if you want more speed on your current 386 or 486 machine?" says George Collins, vice president and general manager of Becco Manufacturing Co. in Chicago.

In other words, there's no clear incentive for users to make the switch.

"I don't think a person would be able to tell the difference, using today's software, between a 486 66-MHz and a Pentium processor," says Chuck Kline, senior systems programmer/analyst at Toledo Hospital.

Cost is the most important concern of PC buyers, according to *Computerworld*'s Buyers' Satisfaction Scorecard survey of 200 information systems managers and professionals (see page 142). Like any commodity purchasers, users want the most value for their dollar. Right now, the top value provider is the 486, according to user interviews.

The reasons users haven't hurried to Pentium and other new chips include:

- **The lack of applications that take full advantage of the processing power.**
- **The high cost of the high-end chips compared with the 486.**
- **Initial problems with high voltage or heat in the early Pentiums.**
- **Users haven't exhausted the capacity of their 486 processors.**

Unfortunately for Pentium and other high-end chips, performance is where they excel; price is a weak point. Pentium users in the Scorecard survey reported the highest satisfaction with processing speed, while cost rated third.

"The Pentium has not transitioned into the business market yet," says Bruce Stephen, director of desktop research at market research firm International Data Corp. in Framingham, Mass. Pentium "has the performance edge, but cost is a problem. Users are waiting for the 90 and 100 MHz prices to come down."

The price point that will shift the market toward high-end PCs, Stephen says, is $2,500 to $3,000 for a completely configured system. This cost has to be accompanied by a 30% to 50% performance increase over the 486.

For this year, the 486 processor will ship in 31.5 million PCs, while the Pentium will capture 3.5 million units and the PowerPC will appear in 800,000 systems (mostly Apple Computer, Inc.'s Power Macintosh), according to Stephen.

Low-cost 486-based PCs are causing users to set a lower price point. Most of the users interviewed set a limit of approximately $1,800 to $2,000 per high-end system. They were willing to backslide on their preset limit to get the PCs exactly when they needed them, but only by $50 to $200 per PC. When the price jumped to $400 more than the limit, they refused to buy.

"If what we want is not available, we won't delay our purchase. We'll switch to another brand," says Dan Doehler, IS manager at Del Papa Distributing Co., a distributor of Anheuser-Busch Co. products in Texas City, Texas.

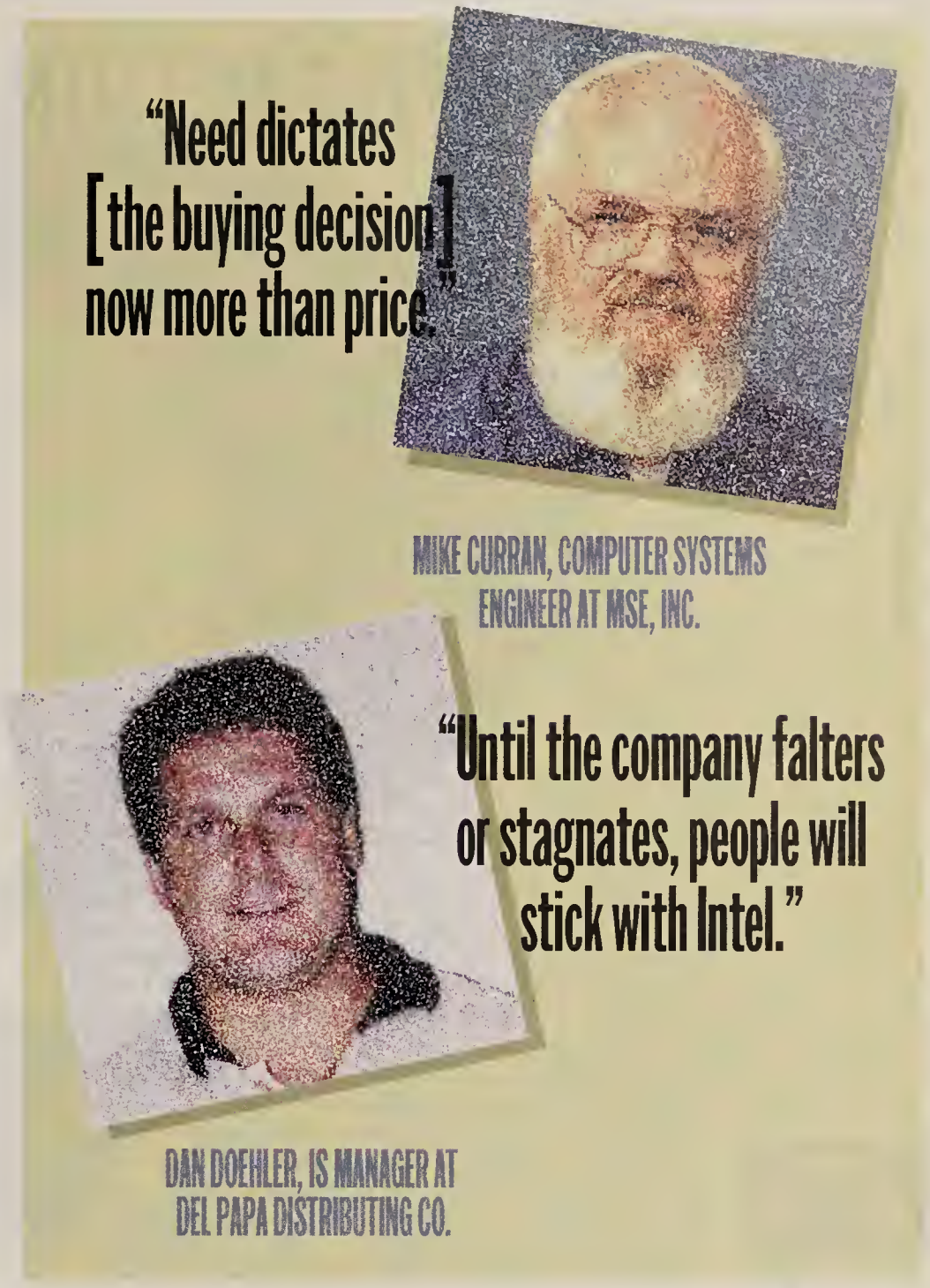
Dan Fry, a software analyst at J & L Specialty Steel, Inc. in Louisville, Ohio, has come to the same conclusion. "One of the first things we ask is: 'How soon can we get this?' Cost is a second consideration because we have already established the price point when we go to purchase," he says.

"Need dictates [the buying decision] now more than price," concurs Mike Curran, a computer systems engineer at MSE, Inc., a waste remediation testing facility in Butte, Mont.

Clearly, competition among PC vendors has benefited buyers in cost and performance, making brand loyalty less of an issue. "The increased concern with availability is a function of the competitive pace," Stephen says. "There's always someone waiting in the wings with just as good a product. One of the reasons NEC and HP have done so well is they've been alternatives to IBM when IBM is not available."

Meanwhile, the jury is still out on which RISC chip will rise to challenge Intel's dominance. Users showed little to no interest in Digital's Alpha chip, regardless of its high performance or which operating system it runs.

"Alpha only runs NT, Unix and OpenVMS," says Scott Bugby, manager of computer services at New Hampshire Public Television in Durham. "It runs Windows/DOS but [only] in emulation mode, which doesn't take advantage of Alpha's advanced RISC chip set. Any time you emulate, you need a lot of horsepower, and you're not taking advantage of the machine."



One user is even leaning toward Intel or Intel clones instead of RISC as the takeoff platform for Unix. "For the 686, Unix will be the operating system of the future," Curran says.

Others say they would choose Intel over the PowerPC even for Unix. "The PowerPC is not a viable replacement for Unix. Why buy a Unix PowerPC when you can put Unix on Intel — a proven platform?" Doehler asks.

The majority also felt IBM's OS/2 system would not move the PowerPC into the forefront.

While the Power Macintosh, built on the PowerPC chip, may be the platform for Macintosh users, most said they believe it won't break the corporate PC stronghold.

"The Power Mac took off in desktop publishing, but it's more costly to put software on an Apple than a Windows/Intel machine. Corporate will go Intel/Windows because everything is cheaper on the Windows side. Everyone wants to save as much as they can these days," Doehler says.

Eventually, the high-end PCs — especially Pentium-based machines — will sport the better price/performance points users are looking for, users and analysts say.

Some users who needed power beyond the 486 have already purchased Pentiums. Many of them waited until the prices dropped and then bought clones. Both Curran and Fry, for example, chose Pentium-based PCs from Gateway 2000, Inc.

Although Pentium will not be popular until prices drop even more, Intel's established lead makes that company the top chip provider choice, even with clone chip makers ramping up production.

— Guide continues on page 142

Gerber is a free-lance writer in San Francisco.

The price point that will shift the market toward high-end PCs, IDC's Stephen says, is $2,500 to $3,000 for a completely configured system. This cost has to be accompanied by a 30% to 50% performance increase over the 486.

BUYERS' SATISFACTION SCORECARD:
Cost, support lead Pentium pack

By Kevin Burden and Michael Sullivan-Trainor

Intel Corp.'s aggressive campaign to move buyers to Pentium-based PCs is shaking up the top tier of PC makers. Market leader Compaq Computer Corp., for example, lags behind Dell Computer Corp. and Gateway 2000, Inc. in producing Pentium-based systems with 90 MHz or greater clock speeds. IBM has also been slower to grow its Pentium line.

"IBM is placing more emphasis on its own triple-clock-speed 486 chip and the PowerPC than it is on the Pentium," says Dominic Ricchetti, director of advanced desktops and workstations at Dataquest, Inc. in San Jose, Calif.

The Buyers' Satisfaction Scorecard polled 50 users of each of these market-leading Pentium-based PCs. The survey revealed that although more than half of the Dell users had 90-MHz PCs, the majority of Compaq and IBM users were operating 60- to 66-MHz systems. Forty-two percent of the Gateway users had 90-MHz models.

Clock speed is an important consideration when evaluating user satisfaction with these systems: The higher-speed systems are more expensive, but 66-MHz Pentiums have shown less of a performance gain over their 486 counterparts than some users expected.

Price is key issue

But cost outweighed performance in terms of importance to users of these systems, and Gateway's low-priced strategy yielded the highest satisfaction rating. Gateway's products scored especially high in value for the dollar. This may have been helped by its decision three months ago to add and upgrade features while keeping the same price.

The 90-MHz models now include a multimedia kit with an upgraded sound card, and the 540M-byte hard drive has been upgraded to a 1G-byte integrated drive electronics hard drive. The 60-MHz models also include a multimedia kit and a 14.4K bit/sec. fax modem.

Despite the majority of Dell users owning higher-priced 90-MHz systems, the company received a higher satisfaction rating than Compaq for cost.

The performance issue, while second in importance to the users, was not a differentiator. The performance of the 90-MHz systems was not compared to 66-MHz performance. Instead, each user was asked to evaluate his satisfaction with his own system.

In other categories, IBM's product sturdiness topped reliability, while Gateway took a hit for failure recovery.

Support was another issue confronting Gateway. Both technical quality and responsiveness were rated below other vendors, mirroring user complaints recently about support problems.

"Gateway has enlisted some of Hewlett-Packard's help [for support], but so far it does not seem to have had an impact," says Jennifer Munson, a research analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

One encouraging sign that the problem may eventually be addressed is Gateway's recent introduction of a three-year standard warranty for new systems, which received the highest satisfaction score for warranty coverage.

Still the best at catering to users' need to keep systems running, IBM scored the highest support satisfaction ratings.

"IBM is making a new push into its support by shipping internal modems with all its Pentium systems," Munson says. The modem lets an IBM support representative remotely dial in and perform diagnostics checks.

Dell also scored well in this area. "Because Dell sells direct and has direct customer contact, it tends to have a greater sensitivity" to support needs, says Bob Johnson, a senior industry analyst of support at Dataquest.

This Scorecard survey was conducted and tabulated by First Market Research in Austin, Texas. An insufficient number of AST Research, Inc. and HP Pentium users were found at corporate sites, so their responses were not included. Reviews of AST, HP and other Pentium systems can be found on page 152. ■

— *Guide continues on page 146*

Burden is *Computerworld*'s senior researcher, CW Guide, and Sullivan-Trainor is *Computerworld*'s senior editor, CW Guide. For more information about this product analysis, contact them at (800) 343-6474.

PENTIUM USER SATISFACTION

RESPONSE BASE: 50 USERS PER PRODUCT

Ratings are based on a 1-to-10 scale, where 10 is best. Total score is the average of ratings weighted by the categories' importance to users. Categories are listed in order of importance to all users.

CATEGORIES	GATEWAY 2000	DELL	IBM	COMPAQ
OVERALL SCORE	6.3	6.4	6.2	6.2
COST	7.7	7.6	8.2	6.9
SUPPORT	6.7	7.4	8.1	7.4
RELIABILITY	6.8	6.9	8.1	7.3
PERFORMANCE	7.3	7.4	8.0	7.4
EXPANDABILITY	6.7	6.4	7.5	6.7
STORAGE	6.9	6.9	7.4	6.7
PACKAGING	7.1	6.9	6.8	6.3
GRAPHICS	7.1	6.9	6.4	6.5
SPECIAL FEATURES	6.4	6.3	5.6	5.9

USERS HAVE COMPLAINED ABOUT LACK OF RESPONSIVENESS

HIGH VALUE-FOR-THE-DOLLAR RATING

GOOD RATING DESPITE ENTIRE SURVEY BASE USING 60- OR 66-MHZ SYSTEMS

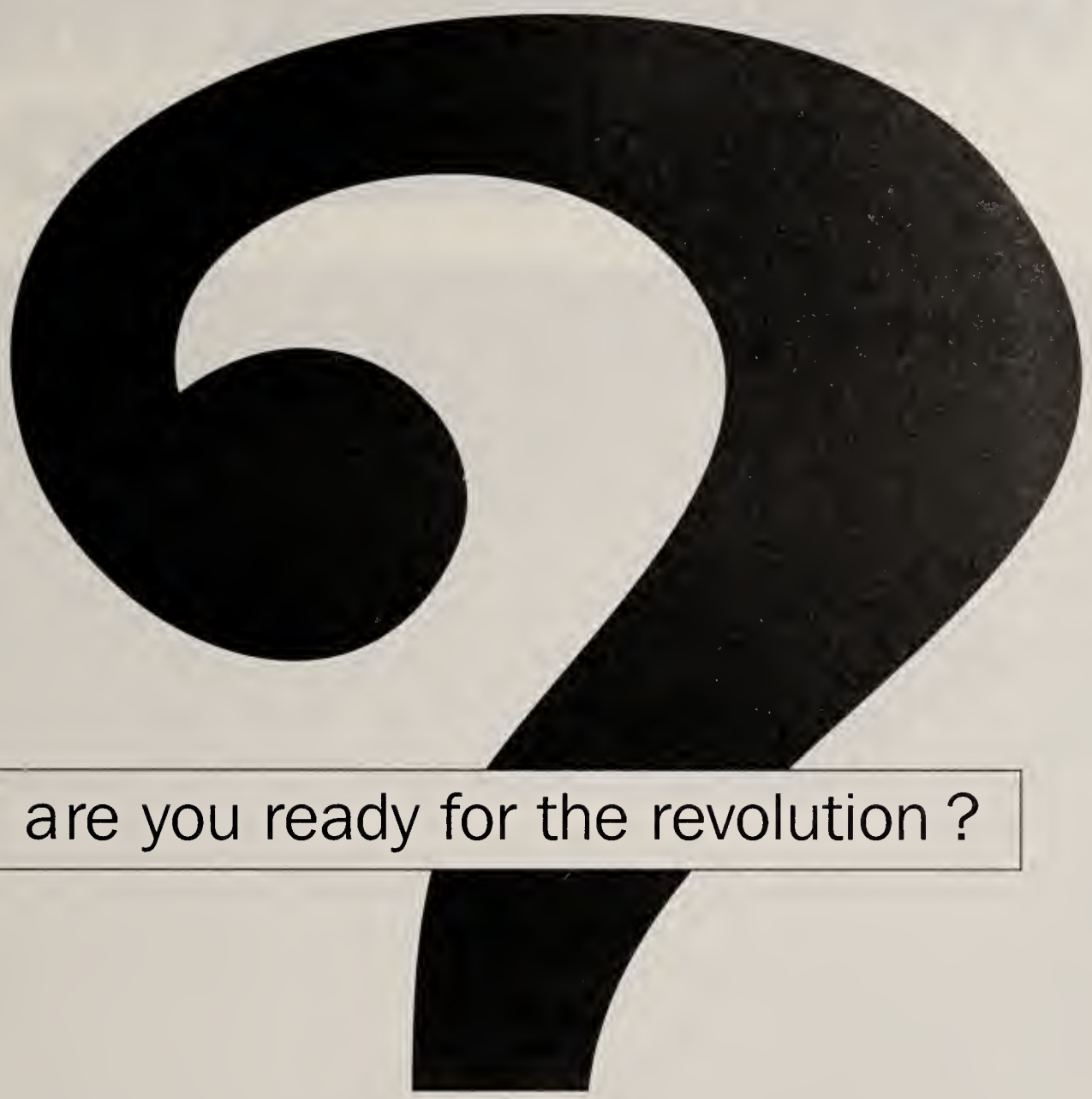
WHAT'S IMPORTANT IN A PENTIUM SYSTEM?

- **COST**
  Value for the dollar
  Cost of purchase
- **SUPPORT**
  Responsiveness of support
  Warranty coverage
  Quality of technical support
- **RELIABILITY**
  Overall reliability
  Recovery from failures
  Effectively dissipates heat
- **PERFORMANCE**
  Processing performance
  Hard-disk performance
  Performance of non-native applications
- **EXPANDABILITY**
  Expansion options
  Upgradability
  Plug-and-play capabilities
- **STORAGE**
  Storage capacity
  Cost of adding storage
- **PACKAGING**
  Quality of monitor
  Quality of keyboard
  Bundled software
- **GRAPHICS**
  Graphics performance
  Multimedia capabilities
- **SPECIAL FEATURES**
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  CD-ROM
  RAID
  PCMCIA
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  Internal modem

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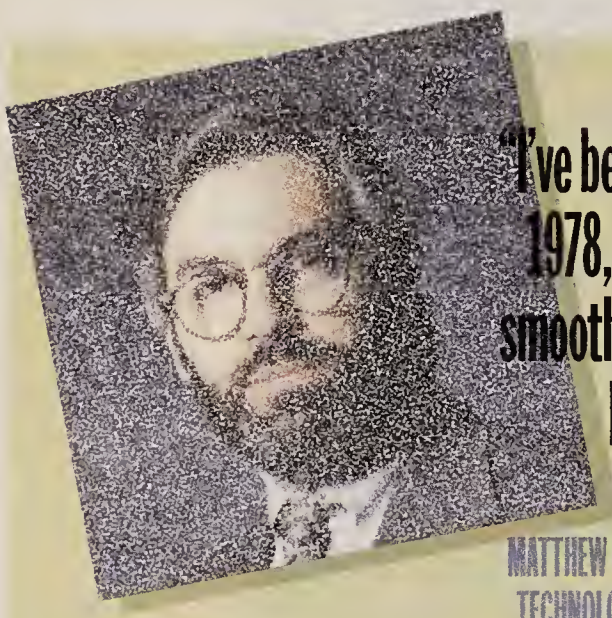
FIRING LINE: Power Mac 8100 a strong performer but pricey

By Kevin Burden

Now that many of the most important business and design applications have been ported to native mode for Apple Computer, Inc.'s Power Macintosh line, the key buying decision for high-end Macintosh users is which system in the Power Macintosh line to buy.

The line, built around the PowerPC 601 RISC processor, includes the 60-MHz Model 6100, 70-MHz Model 7100 and the top-of-the-line 80-MHz Model 8100.

Users who evaluated the 8100 said the system screams when running native applications and seldom crashes when running the new System 7.5 operating system. But even with the 80-MHz speed, Windows applications are still sluggish, and superior price/performance can be had with the other Power Macintoshes.



"I've been in this industry since 1978, and this has been the smoothest hardware transition I have ever seen."

MATTHEW GHOURDJIAN, NATIONAL DIRECTOR OF TECHNOLOGY, NOWREY & SIMON, LOS ANGELES

The four organizations in this evaluation included a law firm, a medical laboratory, a photo studio and a computer consultancy. Their installations ranged from stand-alone workstations to networks of as many as 1,500 Power Macintoshes.

The format was developed with assistance from Howard Rubin and Associates and Technology Investment Strategies Corp. in Framingham, Mass.

Reliability

The Power Macintosh's reliability was dramatically improved with the System 7.5 upgrade. Evaluators said System 7.1.2, which shipped with early Power Macintoshes, fell short in emphasizing the Model 8100's performance.

Consultancy: "System 7.5 makes everything faster: response time, switching between applications, background print spool, etc. The systems have been bulletproof in our shop."

Law firm: "I loaded all my software on the Power Mac without exception, and I crash far less."

Expandability

The tower design leaves plenty of room for expansion options such as another 3½-in. drive or CD-ROM player, but users said the motherboard design made RAM upgrades difficult.

Consultancy: "To do a RAM upgrade in the 8100, you need to pull the motherboard and even the disk drive. It's a pain compared to the easy upgrade on the other Power Macs [6100 and 7100]."

Floating-point tasks

When using floating-point-intensive applications such as the native versions of Microsoft Corp.'s Excel or Adobe Systems, Inc.'s PhotoShop Kai PowerTools, evaluators said functions that typically eat up considerable amounts of time were almost instantaneous.

Law firm: "We moved our economists from 486s to Power Mac 8100s running native Excel. It just blew the 486s away. We're talking speed increases of at least two if not three times faster."

Windows applications

If Power Macintosh has a drawback, it's running Windows applications. Insignia Solutions, Inc.'s SoftWindows will let Power Macintosh emulate a PC, but a 486 25-MHz machine is the best performance you should expect. A new Apple board, which reportedly will boost the power to a 66-MHz 486 machine, could resolve this problem when it becomes available.

Law firm: "At only $200, which is the reported price of the Houdini II board, it's a 'no decision' for us. This problem is practically solved."

Emulation mode

The Model 8100 will run 680x0 applications a little slower than the high-end Quadras, although users said the speed loss was negligible.

Law firm: "For the most part, you don't really notice a difference when running a 680x0 application. Only when running non-native applications like Excel [floating-point intensive] can you see a slowdown."

Native applications

Native applications that run more than twice as fast on Power Macintoshes as on Pentium PCs make Power Macintosh worth every penny, one evaluator said. The availability of such applications is less of a problem now that most key programs have been ported.

GOOD RATING DESPITE PREMIUM PRICE

Consultancy: "When I ran the native-mode version of Word and Excel, I couldn't believe the difference in speed. It was like running a new program."

Handling fonts

When using non-native Adobe Type Manager, evaluators said, screen redraws were slower when they included type. With the native mode, which ships free with PhotoShop, this font problem is a nonissue.

SYSTEM 7.5 CONTAINS ONLY A BARE-BONES UPGRADE MANUAL

Networking

Network performance problems were corrected by System 7.5.

Medical laboratory: "With System 7.1.2, we would have a crash per hour. With 7.5, those problems have disappeared completely."

Support

Users said they were satisfied with the quality of Apple's support, but the vendor's lack of timely responsiveness received less than favorable comments.

Consultancy: "You typically wait a half-hour before you get through. I hope Apple will consider a seven-days, 24-hour service instead of the 6 [a.m.] to 6 [p.m.] Pacific time they use now."

Value

With a $4,399 list price, the 80-MHz Model 8100 costs about $1,000 more than the 66-MHz Power Macintosh 7100 and doesn't boast the same excellent price/performance. But none of the evaluators said they paid too much for what it delivers. ■

—Guide continues on page 149

Burden is *Computerworld*'s senior researcher, CW Guide.

POWER MACINTOSH 8100

APPLE COMPUTER, INC.
Cupertino, Calif. (408) 996-1010

Ratings are based on a 1-to-10 scale where 10 is extremely satisfied and 1 is not at all satisfied. Ratings represent the average of the four users' satisfaction ratings weighted by the categories' importance. Total score is the average of all ratings.

7	TOTAL SCORE
10	RUNNING NATIVE APPLICATIONS
9	PERFORMANCE WHILE ON A NETWORK
9	QUALITY OF DISPLAY
8	RELIABILITY
8	PERFORMANCE OF EMULATION MODE
8	EASE OF FONT USE
7	RUNNING FLOATING-POINT-INTENSIVE TASKS
7	PERFORMANCE OF SYSTEM 7.5 OPERATING SYSTEM
7	VALUE FOR THE DOLLAR
5	EXPANDABILITY
4	QUALITY OF TECHNICAL SUPPORT
3	RUNNING WINDOWS APPLICATIONS
3	DOCUMENTATION

APPLE RESPONDS

Application performance

Apple will announce at Comdex/Fall '94 the Power Macintosh 6100 DOS-compatible system and card, which gives users the option of running a full range of PC software including Macintosh, native Power Macintosh, DOS and Windows applications. Powered by a 66-MHz 486DX2 processor, the DOS Compatibility Card provides increased performance and enhanced networking and multimedia support. The cards are expected to be available starting in January.

Upgrades

Two major improvements to the new Power Macintosh 8100/110 were introduced Nov. 3: faster performance through a 110-MHz PowerPC 601 processor and increased mass storage through a 2G-byte hard disk drive.



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Source: Survey of COMPUTERWORLD CD subscribers, May 1993.

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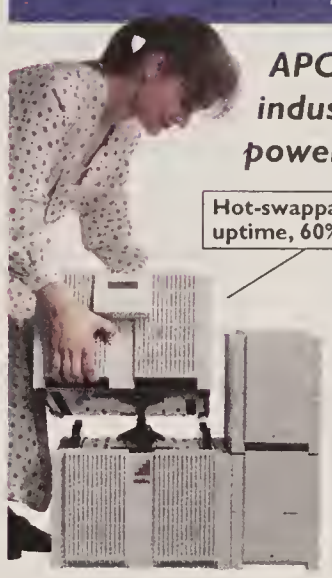
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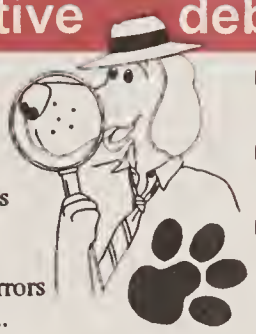
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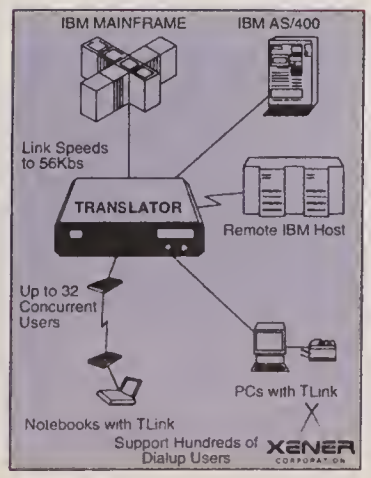
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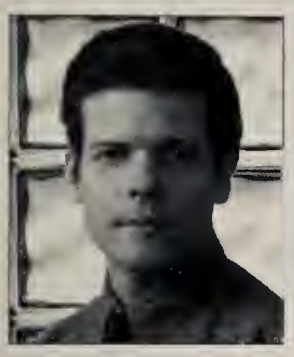
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LAB TEST: Intel's I486 left in the dust by new chip contenders



TED'S SPEED TEST

ABOUT TED: These lab tests were performed by Ted Vegvari, principal at Computer People Resources, an independent consulting and testing firm in Torrance, Calif. Clients include a large financial institution, architectural design firms and educational facilities.

ABOUT THIS TEST: Each system was configured as stated below, and the same set of software was used to run the 13 tests listed in the chart for each of the systems. Comparisons are based on the time it took each system to accomplish each function from start to finish based on the number of seconds.

SYSTEM PERFORMANCE

(IN MINUTES) Lower score means faster performance

	Compaq DeskPro X/L I486 66 MHz	Compaq DeskPro X/L Pentium 60 MHz	Area Electronics Topline Pentium 90 MHz	Carrera Computer Cobra AXP Alpha 275 MHz	NEC Technologies RISCstation 2000 MIPS dual processor
	$4,518	$4,848	$4,270	$8,652	$10,798
FUNCTION Cold start of Windows 3.1.	1.5	1.3	1.2	.48	1
WORD PROCESSOR Launch Word 6.0.	.09	.06	.06	.03	.03
Run Word macro: Load 1M-byte file, globally replace (2,000 words), change font for entire document, repaginate.	14	8	6	1	3.6
SPREADSHEET Launch Excel spreadsheet.	.04	.03	.03	.02	.03
Run Excel macro: Recalculate 60- by 500-cell spreadsheet, update two graphs, export spreadsheet data to delimited file format.	3.2	1.6	1.1	.48	.39
E-MAIL Create CC:Mail 40,000-user post office database.	69	14	12	14	17
Chkstat and reclaim CC:Mail 150M-byte message database.	87	25	19	26	32
DATABASE Run dBase IV (DOS version) program to synchronize 40,000 user names using export files from three CC:Mail post offices.	139	54	35	62	86
REMOTE E-MAIL Open CC:Mail user mailbox remotely using Mobile package; delete Top 25 messages in box from LAN post office.	.12	.10	.08	.05	.05
GRAPHICS Render complex high-resolution 3-D graphic using Pixar s Typestry package.	140	21	14	5	4
Load Micrografx, Inc. s Picture Publisher and a complex 14M-byte image.	.17	.06	.04	.02	.02
NETWORK Load Word 6.0 from the file server in a network installation.	.11	.09	.06	.05	.06
Copy compressed 5M-byte file to and from a Windows NT Advanced Server file server over an Ethernet 10Base-T network.	15	10	9	6	6

By Ted Vegvari

While the Intel Corp. I486-based PC may be the dominant system at most companies today, many users are not completely satisfied with its performance. Two common problems reported by 30 users interviewed in preparation for this lab test were waiting for common tasks to be completed and the system's unresponsiveness when simultaneously opening several large programs.

Alternative high-end PCs with Intel's Pentium, IBM et al's PowerPC and Digital Equipment Corp.'s Alpha chips address these complaints quite efficiently, especially if the PCs use Microsoft Corp.'s Windows NT. NT can run on several different classes of workstations and yet retain the same look and feel.

Most of the new high-end systems use the Peripheral

Left in the dust, *page 152*



COMPAQ DESKPRO X/L

Compaq Computer Corp.,
Houston (713) 370-0670

SYSTEM CONFIGURATION
- 66-MHz 486 chip
- 32M bytes of RAM
- Super VGA adapter with 2M bytes of video RAM
- 1.44M-byte, 3 1/2-in. floppy drive
- 535M-byte hard drive
- Ethernet controller built in
- SCSI II controller built in
- Soundblaster-compatible sound card
- Desktop
- DOS, TabWorks, Windows and MS Sound System, software included

TOTAL $4,518

SYSTEM CONFIGURATION
- 60-MHz Pentium
- 32M bytes of RAM
- Super VGA adapter with 2M bytes of video RAM
- 1.44M-byte, 3 1/2-in. floppy drive
- 535M-byte hard drive
- Ethernet controller built in
- SCSI II controller built in
- Soundblaster-compatible sound card
- Desktop
- DOS, TabWorks, Windows and MS Sound System, software included

TOTAL $4,848



TOPLINE 590GPIP

Area Electronics Systems, Inc.,
Placenta, Calif. (714) 993-0300

SYSTEM CONFIGURATION
- 90-MHz Pentium system
- Desktop case
- 32M bytes of RAM
- 1.44M-byte, 3 1/2-in. floppy drive
- ATI PCI Ultra Pro Super VGA adapter with 2M bytes of video RAM
- Adaptec PCI SCSI II 2940 Controller
- SCSI, 1G-byte hard drive
- Sony SCSI, CD-ROM, double speed
- SB PRO sound card with speakers
- DOS and Windows for Workgroups included

TOTAL $4,270



RISCSTATION 2000

NEC Technologies, Inc.,
Boxboro, Mass. (508) 264-8000

SYSTEM CONFIGURATION
- Single 75/150-MHz Mips R4400MC chip (supports up to two processors)
- Tower case and power supply
- 1.44M-byte, 3 1/2-in. floppy drive
- 3x speed CD-ROM
- 32M bytes of RAM
- 1G-byte hard drive
- Onboard video subsystem using Jaguar graphics accelerator chip
- 10Base-T Ethernet

TOTAL $8,499 single-processor version
TOTAL $10,798 dual-processor version
(street prices considerably lower)



COBRA AXP 275 MHZ

Carrera Computers, Inc.,
Laguna Hills, Calif. (714) 707-5051

SYSTEM CONFIGURATION
- 275-MHz Alpha chip
- Tower case and power supply
- 1.44M-byte, 3 1/2-in. floppy drive
- CD-ROM
- 32M bytes of RAM
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PRODUCT REVIEWS ROUNDUP

These 90-MHz Pentiums are worth a look, according to the leading PC publications' product reviews. They placed either first or second in one or more of the publications' lab tests. Prices are list prices.

SYSTEM	PROS	CONS
AST Premmia GX **AST Research, Inc.** **Irvine, Calif. (800) 876-4278** **$4,359, 16M bytes of RAM**	System setup, documentation, support policies and technical support drew high scores. *Infoworld 10/10/94*	Premmia GX is a high priced unit. *Infoworld 10/10/94*
HP Vectra XU 5/90 **Hewlett-Packard Co.** **Palo Alto, Calif. (800) 322-4722** **$4,793**	System setup, design and technical support scored particularly well. There are a high number of high-performance components integrated on the motherboard. *Infoworld 10/10/94*	Low score in expandability: two 32-bit slots; four drive cache; only one drive bay; and five slots open after configuration. *Infoworld 10/10/94*
Micron P90PCI Powerstation **Micron Computer, Inc.** **Nampa, Idaho (800) 388-633** **$2,899, 16M bytes of RAM;** **$2,299, 8M bytes of RAM**	Micron s system is a solid, above-average performer. *PC Magazine 9/27/94* The business upgrade to get when the purse strings are tight. *PC Computing 9/94*	DOS application benchmark performance was not impressive. *PC Magazine 9/27/94* Scores an average rating on performance. *PC Computing 9/94*
Poly 586-90VL **Polywell Computers** **San Francisco, Calif. (800) 999-1278** **$3,500, standard configuration**	The fastest 90-MHz Pentium we ve seen to date when running Windows applications. *PC Computing 9/94*	Users should upgrade to a 17-in. monitor over the 15-in. standard. *PC Computing 9/94*
Pantera 90 **Zeos International Ltd.** **Minneapolis, Minn. (800) 423-5891** **$2,145, 4M bytes of RAM (entry level)** **$2,995, 16M bytes of RAM (most popular)**	First-place rating for speed based on the strength of the graphics card. *Computer Shopper 9/94* Offers good performance for your dollar. *PC Magazine 9/27/94*	Size of daughter card is limiting. *Computer Shopper 9/94* Limited expandability as a result of poorly placed components. *PC Magazine 9/27/94*

Left in the dust

CONTINUED FROM PAGE 149

Component Interconnect specification that Intel introduced in 1992, which enables workstation-like performance at the PC level.

To test how the high-powered Pentium and RISC-based PCs stack up against the tried-and-true 486-based systems, we ran common applications and processing tasks on the five systems and timed performances. The systems included Compaq Computer Corp.'s DeskPro X/L (a 486-, 66-MHz version as a benchmark and a Pentium, 60-MHz version); Area Electronic Systems, Inc.'s Topline 5906PII' (Pentium, 90 MHz); Carrera Computer Inc.'s Cobra AXP (Alpha, 275 MHz); and NEC Technologies, Inc.'s RISCstation 2000 (dual processor).

To level the playing field, all systems were configured with graphics adapters with at least 2M bytes of video memory configured for a video resolution of 1,024 by 768 by 256 colors, 1G-byte SCSI drives with access times of at least 16 msec and an internal, double-speed CD-ROM drive.

The Pentium and 486 systems were configured using video cards that support both Windows 3.1 and Windows NT 3.5. Intel 486 and Pentium systems are switch-hitters, able to run both Windows 3.1 under DOS and Windows NT.

Each system was configured with Windows NT 3.5. To emulate a user's working environment, the most popular applications were in the start-up group — Microsoft's Word and Excel, Symantec Corp.'s Act, Wall Data, Inc.'s Rumba and Lotus Development Corp.'s CC:Mail Mobile.

We were never left waiting for these applications to perform on the Pentium, Mips Technologies, Inc. and RISC systems. We could not use Delrina Technology, Inc.'s WinFaxPro on any of the systems while running NT.

The 486 was irritatingly slow after setup and configuration was completed. For example, the 486 system took more than two hours to completely render an image using Pixar's Typestry, compared with the more powerful systems, which took no longer than 21 minutes.

The bottom line: Alpha, Mips and Pentium are all strong performers if the applications you use are available for your selected platform. This will become less of an issue as more 32-bit applications become available for NT and Windows 95, the next version of Windows.

Alpha and Mips

Alpha and Mips provide two to three times faster performance than Pentium. They are well suited to — but in no way limited to — graphics, client/server, electronic mail and computation-intensive applications.

The built-in Ethernet adapters were detected and configured by NT during setup, and throughput was excellent. File transfer times equaled those of Extended Industry Standard Architecture adapters in other systems. The NEC video was fast even at 1,024 by 768 by 256; a 17-in. or larger monitor is recommended.

Multitasking was smooth, and we never lost a modem connection no matter what the systems were doing in the background or foreground or how many programs were running.

Pentium

Pentium, while priced higher than the 486, is the least-expensive replacement for installed systems and is most closely designed to replace them. The Pentium will run DOS and other software developed for 286, 386 and 486 processors, but it is not as fast as Alpha or Mips chips.

If you plan to use Corel Systems Corp.'s CorelDraw, Delrina's WinFaxPro or any other 16-bit graphics or communications program that relies heavily on the Windows Graphic Device Interface or hardware calls, this is the system for you until 32-bit versions of those programs become available.

The 486

While the 486 is the low-priced alternative now, in a few months it will probably cause more grief than it's worth when a plethora of new software is released. The 486 is already too slow to reliably send or receive a fax in the background while running other large applications in the foreground. Resources are pushed to the extreme, causing frequent application errors and requiring reboots. ■

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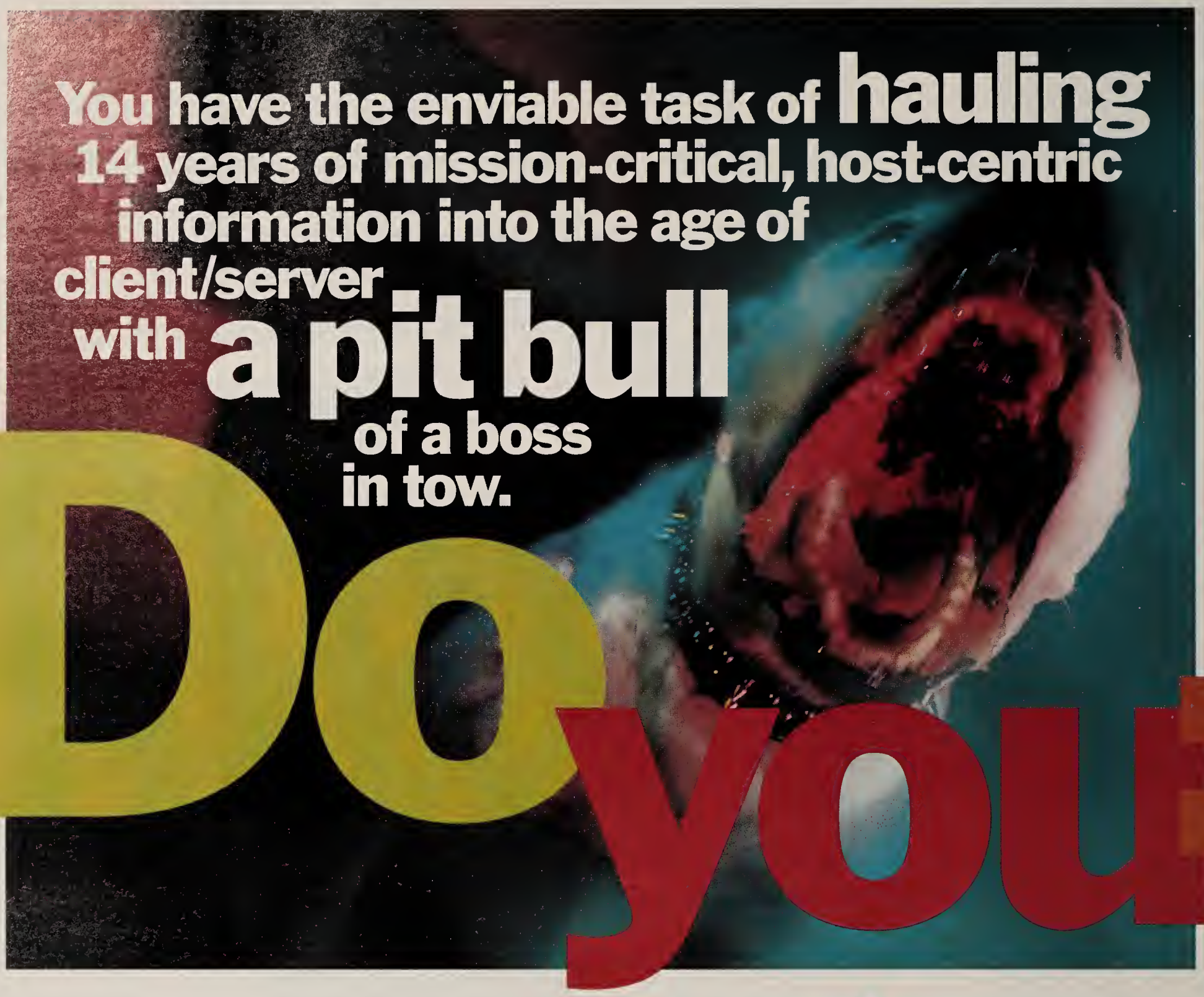
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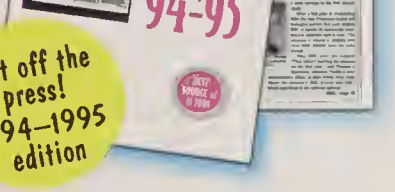
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Client/Server Pandemonium

Brave souls who are pushing ahead with client/server reveal the not-so-pleasant aspects of the technology

By James H. Johnson

When you gather a group of information systems managers who are braving the world of client/server computing, the talk isn't necessarily sweetness and light. In fact, the picture is much darker. "Immature," "unreliable" and "costly" are some of the scary descriptors associated with the technology.

But most IS chiefs are also quick to point out that although the technology is going through some growing pains, they are sticking by it. For them, client/server is the only way to keep their companies responsive to business changes.

That's what we found when The Standish Group International, Inc., a consulting company in Dennis, Mass., brought together 41 information technology executives from Fortune 500 companies that have implemented client/server. We talked to about 10 managers at a time in focus groups in Boston and San Francisco to get their up close and personal views on downsizing. These managers represent a cross section of industries, including insurance, state and federal government, retail, banking, securities, manufacturing and services.

Pandemonium, *page 158*



Johnson is chairman of The Standish Group International, a consulting company in Dennis, Mass., that specializes in open systems, on-line transaction processing and client/server technology.

Client/Server Pandemonium

CONTINUED FROM PAGE 157

All the managers spoke candidly about client/server applications when compared with mainframe and minicomputer technology. Here's what they told us:

Client/server applications are LESS RELIABLE

"I find that as you move further and further out into the world of client/server computing, you have many more pieces that can break. A very high percentage of this is due to software not shaking hands properly with other pieces of the software, especially in the client/server unit. It's just not quite as reliable as it is in the mainframe environment."
—Richard, director of systems at a Boston personal products manufacturer

Client/server software is IMMATURE

"Right now we're into client/server in a big way. We're constantly upgrading our applications software because the vendor software is buggy. I won't name names, but the vendors are constantly in competition and adding functionality rather than taking care of quality. And I'm not talking only application [vendors]. It is the infrastructure software vendors as well."
—Jack, MIS director at a Boston hospital

Client/server applications are LESS AVAILABLE

"Right now, what we're looking at is . . . will we have the same high availability [as on the mainframe]? You have more things that can fail when you distribute [processing] — more boxes, more risk of failure somewhere — although maybe it would be less catastrophic if one server went down at one plant vs. the main cluster.

"But the chances of [failure] happening, we believe, are going to be greater as you put more clients out on more desktops and as you put more servers out there. Right now, we have all the right personnel and the right [fault-tolerant] computer rooms to solve the problem when it happens. But will we have all the right personnel at each plant, at each office?

"It's going to be much more difficult in the distributed network environment to achieve that goal of high availability. We're going to have components all over the network — in separate libraries and databases and servers. It's going to take quite a long time to get that done."
—Kevin, manager of application development at a Boston services company

Client/server applications are LESS SECURE

"My most-dreaded source of unauthorized access [is] our local-area networks and wide-area networks. Now that everything is based on communications line access, if you lose your access to the data, you've lost everything. Everybody stops dead. Our failure to protect our backbone ring would probably be the most serious thing that could happen to us. Currently, our wide- and local-area networks do not do a good job of preventing anybody from getting to anything either on the centralized host or to the local file servers."
—Jim, director of MIS at a Massachusetts state agency

Client/server applications have POORER RESPONSE TIME

"Response time is worse with client/server [than with mini- or mainframe-based systems], and users are not as productive. In some cases, the response time went from a fraction of a second up to 30 seconds. Imagine looking at a static screen for 30 seconds. We ended up redesigning the whole system."
—Dave, director of MIS at a San Francisco hospital

Client/server stresses out PEOPLE

"The first challenge is trying to get the various information managers at the different locations to give me an inventory of what they truly have. Nobody wants to give up their information. [The information belongs to them. They think] you are going to take their job, so that makes it difficult. The second piece is getting the management at the various locations to change any technology. We have a combination of Amdahl, AS/400s, HP, Digital VAX and Bull [equipment]. It's a mind-set. It's very difficult to get all of the management — even at the local level — to agree on a set of rules like a protocol. You have to agree on a set of rules. That's a challenge in itself because you have to, in some cases, convince [managers] that this is best for the company — not necessarily best for the manager. You have to have that buy-in. If you don't have that buy-in, you're going to fail. I don't care how big or how small the project is."
—Jim Crear, director of information technology, Instrumentation Laboratories, Inc., Boston

Client/server applications COST MORE

"I would say the cost of client/server is astronomical. [The] problem [is that cost] is hidden because it's dispersed. The focus used to be centralized on the mainframe. Now some of [the costs] may be in the user departments; some of them may be in the telecom departments; some of them may be in the network services department; some of them may be in the application department. And if you add it all up, it's probably double or greater than what it used to cost to do the same thing on the mainframe."
—Jack, MIS director at a Boston hospital

Client/server causes data INTEGRITY PROBLEMS

"Unexpected data and dirty data is actually one of the biggest sources of our problems. Things just show up. . . . It's like, 'Gee, who could have figured they could type that in there?' Our biggest problem [is] dirty data causing our applications to fail and [no one] noticing it soon enough. [This data may get] through a couple of cycles of some other application. Client/server applications have no data integrity protection."
—Patrick, director of information technologies at a consumer product manufacturer in San Francisco

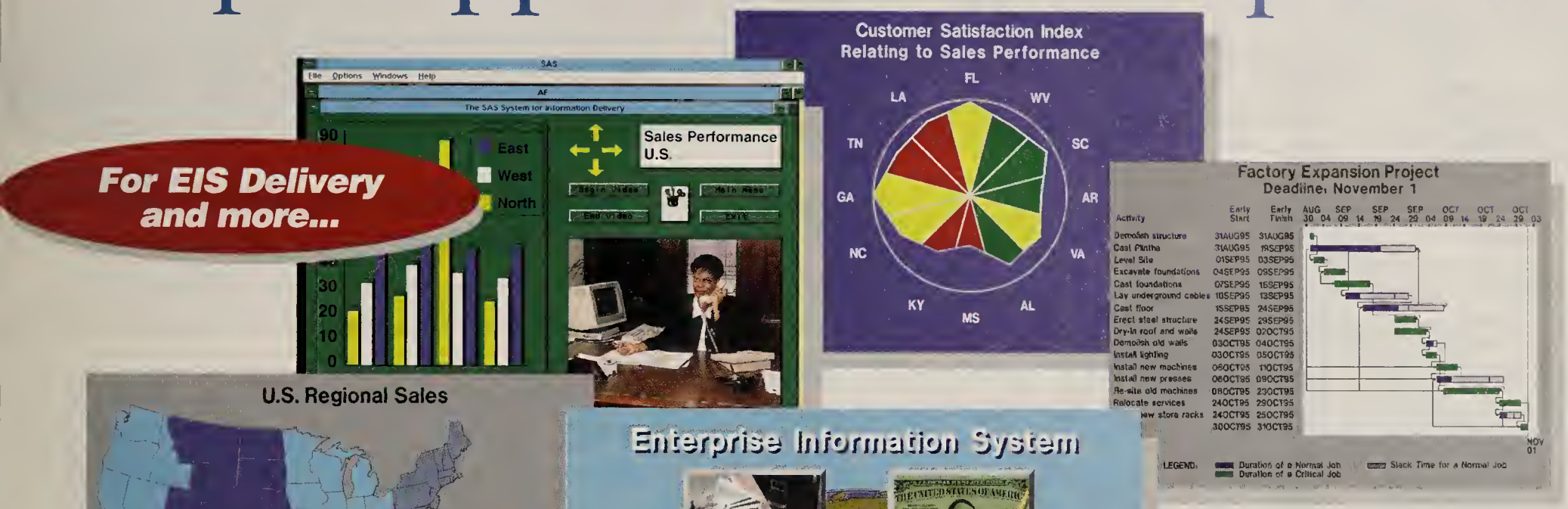
On the Bright Side

Client/server boosts PRODUCTIVITY

"Our numbers don't lie. When I joined the company [in 1991], we had approximately 168 employees and were doing $7 million a year in business. This year, we're going to do $25 million in business, and we have grown to [only] 178 employees. A significant portion of our sales growth or [low] staff growth can be directly attributed to client/server technology and keeping state of the art, particularly in administration.

"Maybe we were a backward company when I joined. We had a manual financial system, believe it or not, manual order entry, etc. We've been able to increase our productivity because we've been able to give our end users very friendly applications, basically off-the-shelf applications. So, yes, we spend a lot of money on client/server but, boy, has it paid off in productivity gains."
—Jeff, vice president of technology at a Boston direct-mail service company

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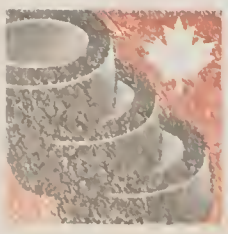
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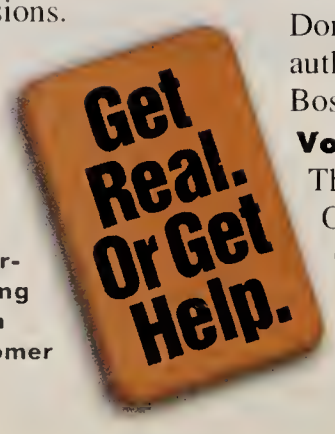
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Separation anxiety

AS TECHNOLOGY *MOVES* FROM MAINFRAMES TO PCs, WORK STYLES CHANGE WITH IT. INFORMATION SYSTEMS MANAGERS AND STAFF MUST COPE WITH TEAMS BUILT AROUND *RADICALLY DIFFERENT* MIND-SETS. HOW ARE THEY COPING?

By Bronwyn Fryer

Ron Calderone, director of client/server at the U.S. headquarters of pharmaceutical firm Boehringer-Ingelheim in Richfield, Conn., doesn't like the idea of dividing his staff into two distinct groups, with mainframers on one side and client/server folks on the other.

But because his department faces volumes of work while converting applications such as a research and development database from VAXs to a Unix-based client/server environment, Calderone says he feels he has no choice. "We must separate the mainframe people from the client/server people, even though the mainframe people resent it," Calderone says. "It's the only way to handle the work load."

Despite the desire to integrate themselves and their Cobol programmers into the changing technological tide, the need to maintain legacy systems forces some managers to divide in order to conquer. Yet this solution can create an even larger personnel problem.

The issues of jealousy and elitism presented by a segregated staff are not new, explains Peter Kormann, president of Tri Pacific, a consulting and systems integration company in Alameda, Calif. Information systems managers have traditionally divided their staffs into a maintenance group and a development group.

"If the maintenance staff hated the development staff, at least they were on the same platform," Kormann notes. "But today, you still have maintenance happening on the mainframe, but all the development is in the 'cool' client/server environment. The problems of resentment are exponentially worse."



Mary Beth Welch

Because the different technologies in which people are immersed reflect the way they want to be managed, another problem for managers is dealing with staffers who have two distinct ways of working.

Gordon Simpson, for example, is a technical architect at Walker Interactive Systems in San Francisco, a financial systems development firm. Simpson was formerly a CICS expert before he underwent the transformation to client/server architect. Today, he holds the reins for a mixed group of Unix developers and Cobol programmers.

Despite a solid understanding of both environments, Simpson says he initially found managing a team consisting of people with two radically different mind-sets was like learning to juggle knives and torches.

"Going from a very structured, pedantic world of mainframe programming to the unstructured environment of Unix is hard enough for a staff programmer, but from a management perspective, it can be very frustrating," he says.

That is because the two mind-sets have different expectations in terms of discipline. "Unix programmers are the range riders of the development world," says Kevin Schick, research director for application development and management services at Gartner Group, Inc. in Stamford, Conn. "They don't like fences and roads, and they reflect the Spartan quality of their environment. Cobol programmers are more established."

Such a difference in mind-set presented a challenge for Simpson, who found himself having to answer two sets of fundamental questions during a project converting 8 million lines of Cobol code to run under Unix.

"Our mainframe people were most interested in how things should be done, the coding standards, the documentation and a definition of the process," Simpson recalls. "The Unix people, who were used to

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Anxiety

CONTINUED FROM PAGE 163

working in a fast-changing environment without many tools or resources, were most interested in which library things belonged in."



Managing the managers

On the staff side, the switch from the world of mainframes to the seat-of-your-pants development environment of client/server poses just as many challenges.

IS professionals trained in skills such as Sybase, Inc. or Oracle Corp. administration, Powersoft Corp.'s PowerBuilder development or object-oriented programming can suddenly find that they need to manage their managers, who can lack a clear understanding of the radically different nature of their work.

"When you're faced with developing in a new client/server environment where everyone is trying their best to learn while working, it's often a case of the blind leading the blind," Kormann says. "If a manager hasn't worked in the client/server arena, the staff can't get firm answers or clear direction."

For example, the iterative nature of the client/server environment makes it harder for IS staffers to pin down exact delivery dates, something that makes uninitiated managers uncomfortable. "In the mainframe environment, I knew my estimates would be right 90% of the time," Simpson recalls. But in the client/server arena, such firm guesstimates disappear. "Now I know it's more like 50% of the time," he says.

Jonathan Wallace, vice president of operations at Pencom Systems, Inc., a 500-employee open systems recruiting firm in Austin, Texas, says what's missing on the managers' part is a solid conceptual understanding of the new environment. "The mainframe mind-set is a waterfall, where once a certain phase of a project is complete, you don't go back," Wallace explains. "The client/server or object-oriented mind-set can be more like a spiral. If the manager has a waterfall approach and I have a spiral approach, the manager may think I'm doing a bad job because I'm working iteratively."

As a result, IS professionals are often forced to take on multiple roles as analysts, programmers and integrators as well as educators and communicators, Kormann says. For example, an object-oriented programmer must be prepared to explain why a start-to-finish time schedule cannot apply to the world of objects and modules, how difficult it is to "get there from here" and how the delivery process changes.

"In client/server environments, the time frames are shorter, so you have to be more productive while teaching your manager how to work with you," Kormann notes. "You have to be more versatile in every area."

Making a transition

Some observers place all these difficulties squarely at the feet of those managers who are unwilling or unable to change with the times and fail to communicate adequately. "The issue is that the management has to change the way they work with application developers just as much as they have to change tools and the programming," argues Carol Realini, president of J. Frank Consulting, a client/server consulting firm in Palo Alto, Calif.

Because of the increased use of client/server tools and technologies that defy linear, hierarchical ways of working, experts such as Realini predict it is merely a matter of time before managers are forced to change their work styles as well as be more team-oriented. "Thank God that client/server changes the way you solve business problems," she says. "Ultimately that means IS departmental managers must adapt a more flexible, team-oriented approach to management."

To do this, managers must work hard to break down the walls between the two groups, Schick says. "Managers need to learn to balance time considerations with work quality and personnel and work-style flexibility and then let the team bring their strengths together," Schick insists.

Ultimately, taking a proactive, communicative management approach can pay off.

"From a management point of view, it's no tougher to get people trained and working together than it is to keep people separated into two groups," Simpson says. "That's because you don't have the personnel issues of an unhappy staff or the resignations. You end up with a better department." ■

Fryer is a free-lance writer in Boulder Creek, Calif.

How they *cope*

Mix and *match*. Once a common vocabulary is established, mainframe and client/server staff can concentrate on common tasks such as integrating workstations and the mainframe, developing distributed data access applications and using legacy systems to pull out objects, says Kevin Schick at Gartner Group in Stamford, Conn. Thinking in terms of locating reusable components is also helpful, he says. "You can't rewrite everything, so the team can work together to identify which parts of the system are the most appropriate for rewriting."

"In client/server environments, the time frames are shorter, so you have to be more productive while teaching your manager how to work with you," *Peter Kormann* says.

How they *cope*

Start *small*. Consider setting up the mainframe group with its own LAN, suggests Peter Kormann at Tri Pacific in Alameda, Calif. "Doing some development work of simple, non-critical applications on a LAN with PCs that link to the mainframe and making it as close to a client/server system as possible lets mainframers get their feet wet."



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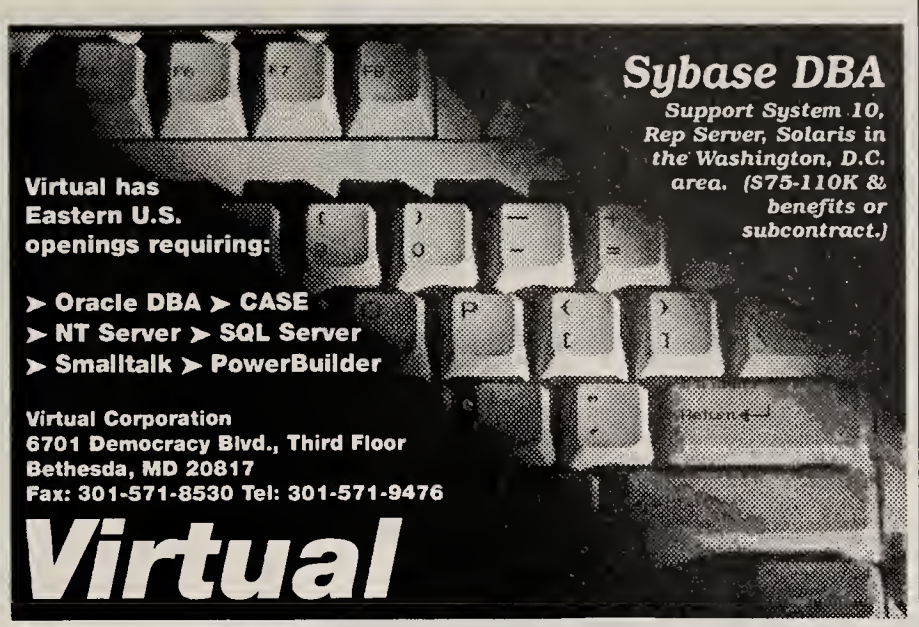
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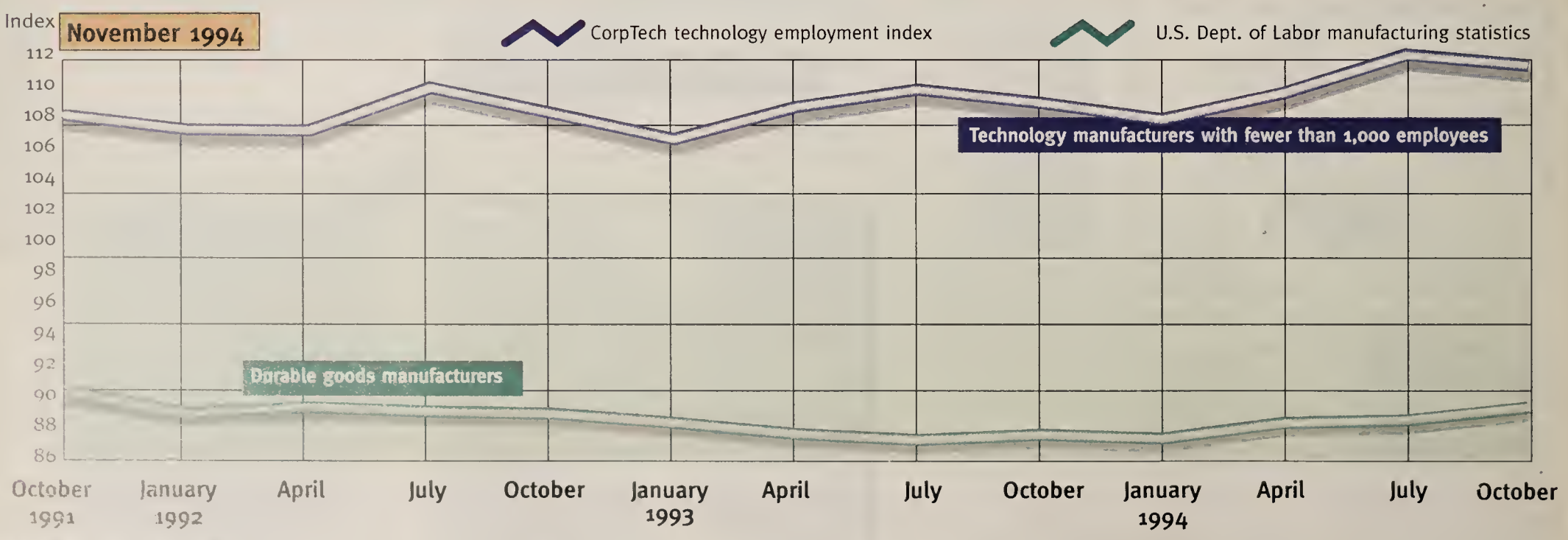
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■ HIGH-END CHIPS AREN'T WOOING DOGGED INTEL 486 USERS ANY TIME SOON. SEE CW GUIDE TO DESKTOP PCS, PAGE 139.

486 vs. PENTIUM

By Julie Hart

Industry watchers recommend putting off buying Pentium PCs until early next year when substantial discounts kick in. In turn, street prices for high-end 486-based PCs are expected to hit rock bottom by mid-1995.

The word on the street is clear: If you're a corporate buyer, wait as long as you can before buying a 486 or Intel Corp. Pentium-based PC. "Prices drop every month," says Jennifer Munson, a research analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "The longer you wait, the better deal you'll get."

Prices for 60- and 66-MHz Pentium machines are falling an average of $50 per month, while low-end 486s — 33 MHz and slower — are plummeting $150 per month. High-end PC prices are in between, averaging a $100 drop per month.

By early next year, buyers will begin to see price dips on high-end Pentium models. "Next month, Compaq is supposed to introduce high-end Pentiums that will start the ball rolling on falling [high-end] Pentium prices," Munson says. Competing vendors are likely to follow suit.

Moreover, Pentium PC prices may be slashed again when IBM's PowerPC machines hit the market, likely by the end of the year. "At this point, though, it's too early to predict the effect of the PowerPC chip," Munson says.

Waiting for the big drop

If you need a Pentium machine, try to wait until at least January or February, when more substantial price cuts will start. If it isn't urgent, wait until spring, says Robert Corpuz, a PC industry analyst at Dataquest, Inc. in San Jose, Calif. "Windows 95 is supposed to come out in April or May," Corpuz says. The announcement of Microsoft Corp.'s next version of Windows may jump-start Pentium demand in the corporate market, fueling aggressive price wars among Pentium vendors, he says.

But keep in mind that if you plan to purchase a Pentium to run Windows 95, expect to buy a high-end system. "You'll need at least a 66-MHz machine with 8M bytes of RAM and half a gigabyte of hard disk space," says Jenni Ceurvels, senior market analyst at BIS Strategic Decisions in Norwell, Mass. And if you store large amounts of data or run complex applications, you may need even more power.

But if your company plans to remain faithful to the 486 market, buyers who wait until the middle of next year to purchase 100-MHz 486 PCs can expect rock-bottom deals. "It will be a good time to buy a lot of power at a low price," Munson says. And, she adds, if your company demands low-end 486s, today's prices are a bargain, but prices will continue to drop until they bottom out in mid-1995. ■

Hart is a free-lance writer in Sunnyvale, Calif.

The watchword is wait. Street prices for Pentium-based PCs are expected to drop by early 1995. Significant price cuts for 486 systems will be close behind.

Pentium-based PCs*

Series	Model	Hard drive (M bytes)	8/94 (street price)	9/94	10/94
AST Bravo MS 5/60	420	420	$2,400	$2,299	$2,299
AST Premmia MX P/60	730	730	$3,595	$3,477	$3,499
Compaq DeskPro XE 560	270/w	270	$2,688	$2,617	$2,650
Compaq DeskPro XL 560	535/CDS	535	$3,659	$3,659	$3,399
Dell OptiPlex 560/L	270	270	$2,170	$2,070	$1,970
Dell OmniPlex 560	1000 SCSI	1,000	$4,218	$4,158	$4,098
DEC Celebris 560	270	270	$2,199	$2,199	$2,199
DEC DECpc XL 560	16/1GB/cd	1,000	$4,549	$4,149	$4,149
Gateway 2000 P5-60	340	340	$2,275	$2,244	$2,194
Gateway 2000 P5-60	1000	1,000	$2,695	$2,499	$2,419
IBM PC 350/60	364	364	**	**	$2,300
IBM PC 350/60	540	540	**	**	$2,829
NEC Image P60	250-CD	250	$3,307	$2,940	$2,768
NEC Image P60	540-CD	540	$3,465	$3,234	$3,044

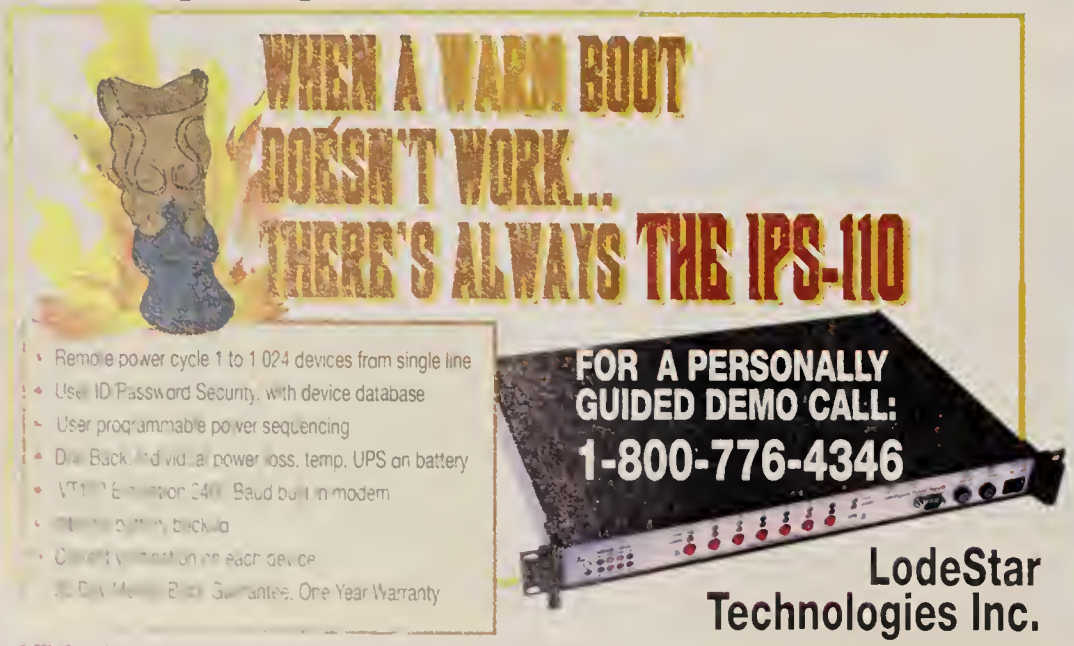
* 60-MHz machines with 8M bytes of RAM.
** Prices not available; machines announced in October.

486DX2-based PCs*

Series	Model	Hard drive (M bytes)	8/94 (street price)	9/94	10/94
AST Bravo LC 4/66D	273w	270	$1,829	$1,730	$1,699
AST Premmia MX 4/66	730	730	$2,954	$2,937	$2,919
Compaq ProLinea 4/66	200/w	200	$1,449	$1,399	$1,399
Compaq DeskPro XL 466	535/CDS	535	$3,336	$3,336	$3,219
Dell Dimension 466V	210	210	$1,459	$1,549	$1,549
Dell OmniPlex 486DX2/46	1000 SCSI	1,000	$4,217	$4,495	$4,495
DEC DECpc LPx+ 466D2	4/170	170	$1,588	$1,621	$1,621
DEC DECpc XL 466D2	16/535/cd	535	$3,050	$3,125	$3,399
Gateway 2000 4DX2-66	340	340	$1,544	$1,544	$1,559
Gateway 2000 4DX2-66 Deluxe	1000SCSI	1,000	$2,869	$2,319	$2,319
HP Vectra VL2 4/66	M210	210	$2,109	$1,729	$1,729
HP Vectra XM2 4/66I	M540	540	$2,859	$2,859	$2,859
IBM Point Performance 46	364D	364	$2,404	$2,379	$2,019
IBM Point Performance 46	527MT	527	$2,772	$2,629	$2,259
NEC Image 466ES	210	210	$1,914	$1,941	$1,635
NEC Image 466M	420	420	$2,807	$2,863	$2,612
Zenith Z-Select 100	66DX/2	210	$1,699	$1,601	$1,440
Zenith Z-Station 500	66/510	510	$2,869	$2,658	$2,317

* 66-MHz machines with 4M to 16M bytes of RAM.
Source: WorkGroup Technologies, Inc., Hampton, N.H.

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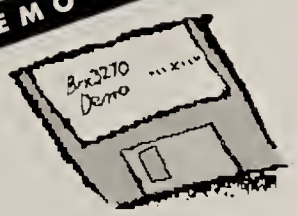
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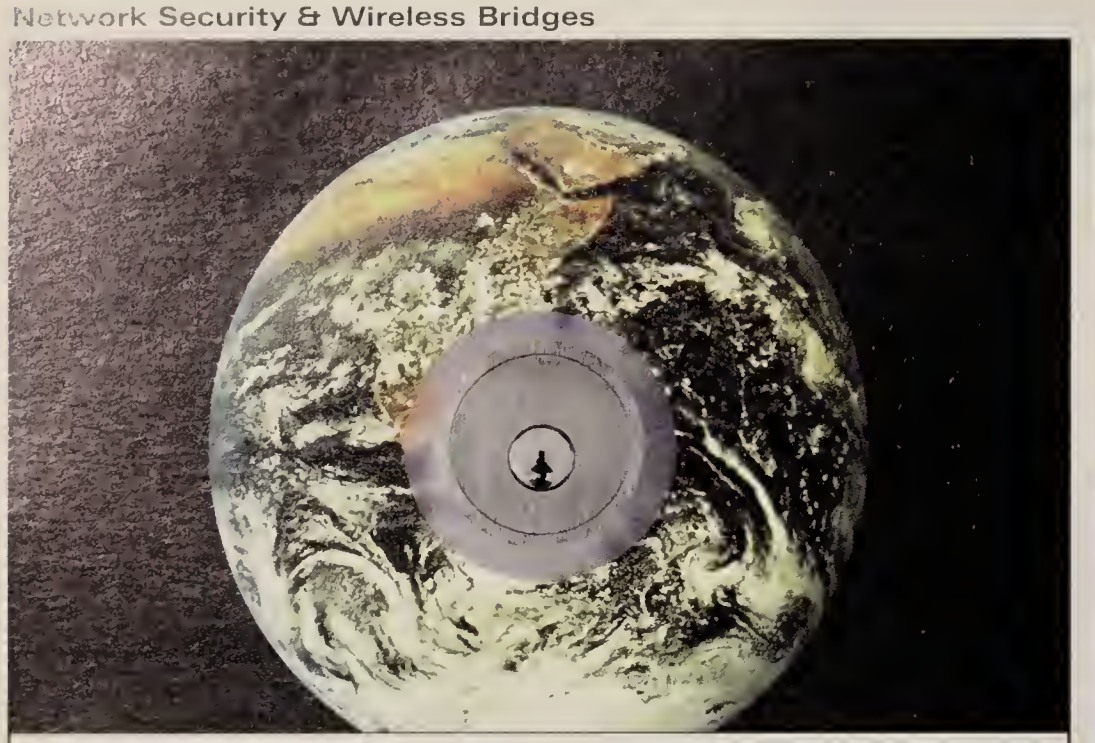
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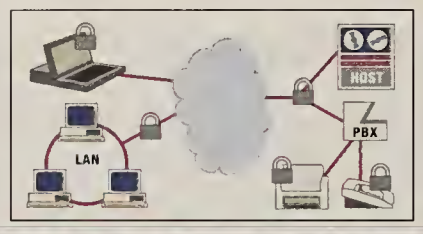
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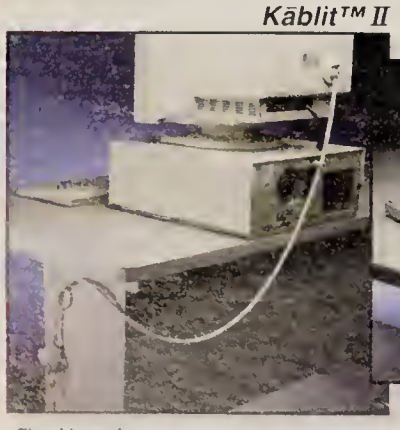
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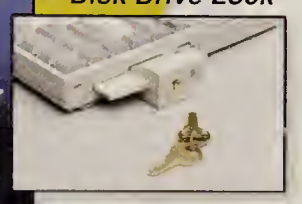
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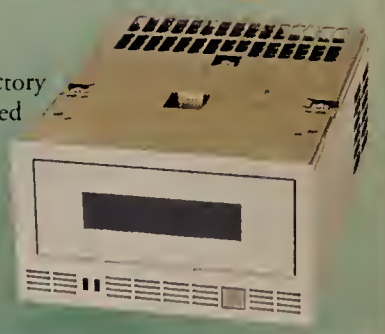
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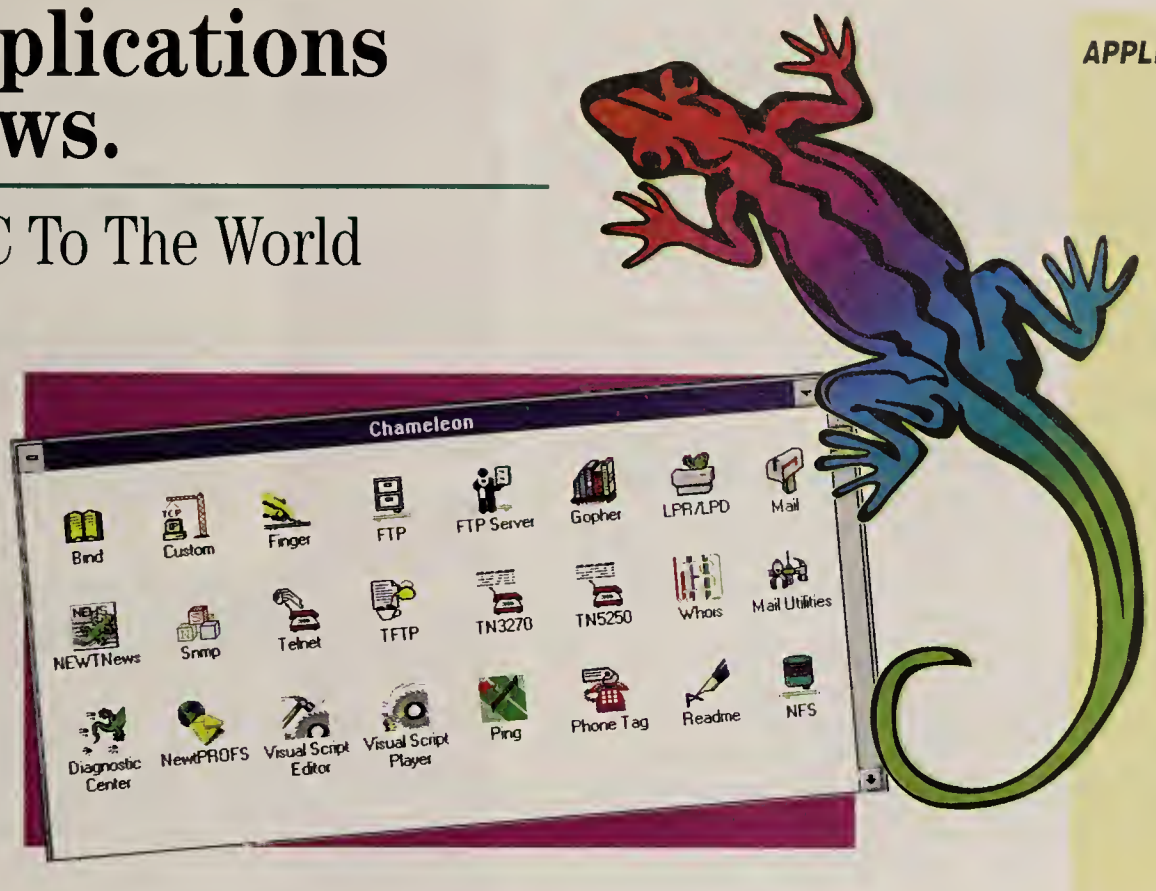
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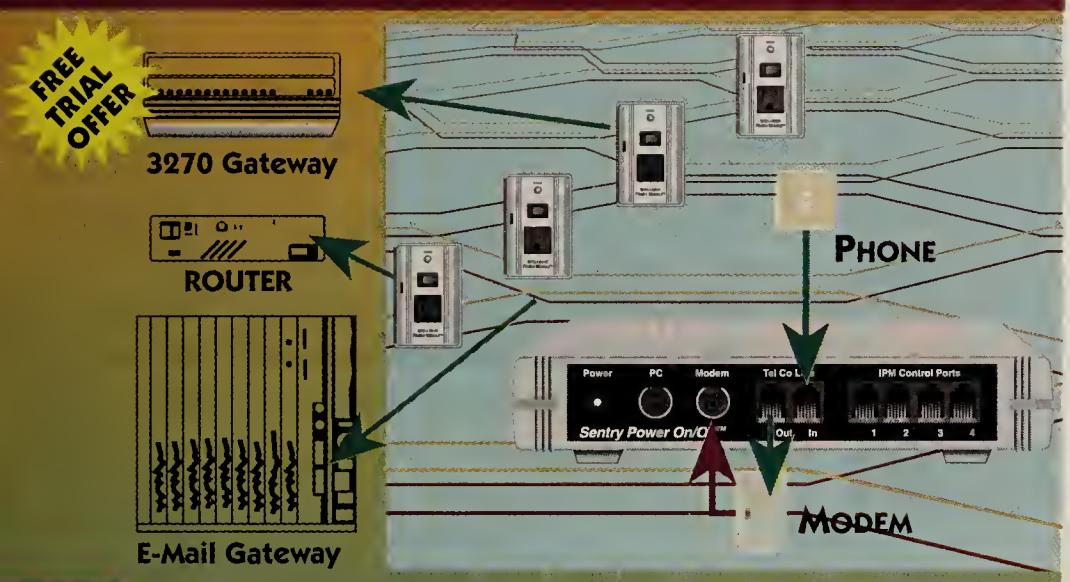
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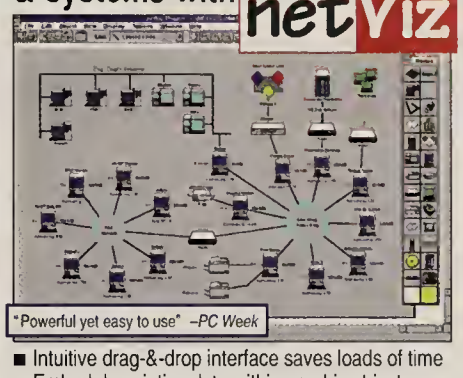
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Nov. 11 Stock Ticker

Gainers

Percent

Struct. Dynamics Research	37.1
Xylogics Inc.(H)	19.0
Newbridge Networks Corp.	13.7
Boole & Babbage	13.6
Printronix Inc.	12.8
Dataram Corp.	11.7
Manugistics Group Inc.	10.9
Trinzic Corp.	10.8

Dollar

Xylogics Inc.(H)	5.50
Newbridge Networks Corp.	3.88
Boole & Babbage	3.00
Printronix Inc.	2.75
Hewlett Packard Co.(H)	2.25
DSC Communications	1.88
Centigram Communications	1.75
Picturetel Corp.(H)	1.75

Losers

Percent

4th Dimension	-18.5
Rasterops(L)	-16.0
Magic Software Enterprises(L)	-12.5
CE Software	-12.5
McAfee Associates	-12.3
Intelligent Electronics	-12.0
Standard Microsystems Corp.	-9.6
Sierra Semiconductor	-9.5

Dollar

Stratacom Inc.	-5.13
Powersoft	-4.50
FORE Systems Inc.	-4.50
Tektronix Inc.	-2.75
Xerox Corp.	-2.63
Sybase Inc.	-2.50
Standard Microsystems Corp.	-2.38
Seagate Technology	-2.13

Semiconductors dropped after the book-to-bill ratio fell from 1.03 in September to 0.97 in October. IBM stock dropped 2 points following a report that European sales have declined.

Industry Almanac

Enterprise on the rise

Vendors attempting to meet the increasing demand for enterprise software are beginning to show whether they can rise with the tide, Wall Street analysts say.

For example, one emerging and unexpected leader in the enterprise software industry is **IMRS, Inc. (IMRS)**.

"Not many people have heard of IMRS because it's had a fairly narrow product niche," said Chris Mortensen, an analyst at Alex. Brown & Sons in New York. "But it's market share is just behind **Oracle Corp. (ORCL)**."

IMRS' strong reputation for financial reporting and consolidation software will boost the company's move into more mainstream accounting applications, Mortensen predicted.

"Hyperion has an installed base of over 1,600 users. Their new products are tightly integrated with that application, so a lot of those users are sure to buy them," he said.

Gaining ground recently is **Legent Corp. (LGNT)**, according to Rich Edwards, an analyst at Robertson Stephens & Co. in San Francisco. "They're addressing user needs dead on. Their challenge remains sales execution," he said.

Among the companies falling by the wayside in the enterprise industry is **Gupta Corp. (GPTA)**, said Charles Philips, an analyst at Kidder, Peabody & Co. in New York.

"Gupta had good products but focused on the wrong market," Philips said. It targeted power users when it should have been making its products easier to use, he explained.

"At first, having the right product was enough," Mortensen added. "Now, the important thing is to have service and support. They're in trouble if they don't."

— Erin Callaway

In the running

The leaders, up-and-comers and losers in enterprise software

Alex. Brown & Sons	IMRS	**Strong Buy**
	Oracle	**Strong Buy**
	Informix	**Buy**
Kidder, Peabody & Co.	Gupta	**Neutral**
Robertson Stephens & Co.	Legent	**Buy**
Volpe, Welty & Co.	Intersolv	**Buy**

Exch	52-Week Range			Nov. 11 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**Off 0.69%**
OTC	43.25	16.13	3Com Corp.	39.88	-0.75	-1.8
NYS	43.38	36.25	Ameritech Corp.	39.00	-0.38	-1.0
NYS	57.75	49.50	AT&T	54.13	-0.13	-0.2
OTC	26.50	12.75	Banyan Systems Inc.	17.88	0.13	0.7
OTC	43.88	18.63	Bay Networks Inc.	26.75	-0.25	-0.9
NYS	62.00	49.00	Bell Atlantic Corp.	50.25	-1.75	-3.4
NYS	63.50	50.50	Bellsouth Corp. (L)	50.88	-0.63	-1.2
NYS	21.50	10.00	Bolt, Beranek & Newman	18.50	-1.13	-5.7
OTC	15.75	9.00	Brooktrout Technology	11.50	0.25	2.2
NYS	53.00	33.06	Cabletron Systems	49.50	-0.50	-1.0
OTC	43.00	10.00	Centigram Communications	21.25	1.75	9.0
OTC	65.50	31.50	Chipcom Corp. (H)	64.25	-0.25	-0.4
OTC	40.75	18.75	Cisco Systems Inc.	32.75	0.88	2.7
OTC	16.13	7.88	Compression Labs Inc.	9.00	0.44	5.1
OTC	12.38	5.13	Computer Network Tech.	6.50	-0.38	-5.5
OTC	32.00	7.50	CrossComm	10.00	-0.50	-4.8
OTC	3.00	1.50	Data Switch Corp.	2.44	-0.06	-2.5
OTC	35.00	17.88	DSC Communications	32.00	1.88	6.2
OTC	55.75	20.00	FORE Systems Inc.	50.50	-4.50	-8.2
NYS	34.88	8.25	General Datacomm Inds. (H)	32.00	-1.75	-5.2
NYS	37.88	29.50	GTE Corp.	30.75	0.00	0.0
NYS	95.97	78.63	ITT Corp.	85.38	-1.13	-1.3
OTC	29.00	21.38	MCI Communications Corp.	22.00	-0.75	-3.3
OTC	15.75	8.13	MICOM Communications Corp.	14.25	0.25	1.8
OTC	9.75	2.75	Microcom Inc. (H)	8.88	-0.50	-5.3
OTC	31.00	11.25	NetManage Inc.	28.50	-1.25	-4.2
OTC	7.25	4.00	Netrix Corp.	6.75	0.00	0.0
OTC	8.75	3.25	Network Computing Devices	4.13	0.13	3.1
NYS	22.25	7.38	Network Equipment Tech.	19.50	-1.13	-5.5
OTC	23.38	12.50	Network General	20.63	0.00	0.0
OTC	9.63	6.38	Network Systems Corp.	6.88	0.00	0.0
NYS	68.75	26.50	Newbridge Networks Corp.	32.25	3.88	13.7
NYS	37.75	26.00	Northern Telecom Ltd.	33.75	-0.25	-0.7
OTC	26.63	13.38	Novell Inc.	18.25	0.13	0.7
NYS	43.75	33.25	Nynex Corp.	38.00	-0.88	-2.3
OTC	30.00	15.50	Octel Communications Corp.	21.50	0.25	1.2
OTC	23.50	10.75	Optical Data Systems Inc. (H)	21.50	-1.50	-6.5
OTC	7.50	2.75	Penril Data Comm Networks	2.88	-0.13	-4.2
OTC	22.25	10.00	Picturetel Corp. (H)	21.75	1.75	8.8
OTC	8.25	2.13	Proteon Inc.	6.38	0.38	6.3
OTC	14.38	2.75	Racotek Inc.	4.00	-0.38	-8.6
OTC	11.25	4.25	Retix	5.25	0.00	0.0
NYS	23.25	12.44	Scientific Atlanta Inc.	20.63	-0.50	-2.4
NYS	45.25	36.75	Southwestern Bell Corp.	40.25	-1.38	-3.3
NYS	40.13	31.38	Sprint Corp.	31.88	-1.25	-3.8
OTC	26.75	13.38	Standard Microsystems Corp.	22.38	-2.38	-9.6
OTC	61.00	13.00	Stratacom Inc.	53.75	-5.13	-8.7
OTC	15.25	3.88	Telebit Corp.	4.63	0.00	0.0
OTC	46.00	23.00	US Robotics	39.13	0.13	0.3
NYS	47.25	35.63	US West Inc.	36.50	-1.25	-3.3
OTC	28.25	12.75	Xircom	16.75	-0.50	-2.9
OTC	34.50	13.25	Xylogics Inc. (H)	34.50	5.50	19.0
OTC	28.13	11.25	Xyplex Inc.	27.75	0.00	0.0
PCs and Workstations						**Off 0.25%**
OTC	7.50	3.00	Advanced Logic Research	4.38	0.00	0.0
OTC	43.75	24.63	Apple Computer Inc.	41.13	0.13	0.3
OTC	33.00	10.38	AST Research Inc.	12.50	-0.25	-2.0
NYS	42.00	21.88	Compaq Computer Corp.	39.00	-0.50	-1.3
OTC	45.75	19.13	Dell Computer Corp.	43.75	1.38	3.2
OTC	25.00	9.25	Gateway 2000 Inc.	21.88	-1.00	-4.4
NYS	99.50	70.13	Hewlett Packard Co. (H)	98.13	2.25	2.3
NYS	31.63	18.75	Silicon Graphics (H)	30.75	0.25	0.8
OTC	34.25	18.25	Sun Microsystems Inc.	31.50	-0.88	-2.7
NYS	50.75	30.75	Tandy Corp.	42.88	-1.25	-2.8
OTC	6.00	2.38	Zeos International Ltd.	5.31	0.19	3.7
Large Systems						**Off 1.11%**
ASE	10.88	4.63	Amdahl Corp. (H)	10.38	-0.13	-1.2
NYS	8.88	4.38	Convex Computer	7.25	-0.38	-4.9
OTC	3.00	0.50	Cray Computer	1.31	-0.06	-4.5
NYS	33.75	17.75	Cray Research Inc.	18.88	-0.13	-0.7
NYS	11.13	6.63	Data General Corp. (H)	10.50	0.13	1.2
NYS	38.63	18.25	Digital Equipment Corp.	30.88	0.25	0.8
OTC	6.38	2.38	Encore Computer Corp.	3.56	-0.31	-8.1
NYS	51.75	40.97	Harris Corp.	42.88	-0.13	-0.3
NYS	76.38	50.75	IBM	72.50	-0.38	-0.5
OTC	18.75	7.50	NetFrame	8.63	0.38	4.5
OTC	19.50	3.88	Parallan Computer	4.75	0.00	0.0
OTC	16.50	5.38	Pyramid Technology	10.13	-0.13	-1.2
OTC	20.13	11.13	Sequent Computer Sys. (H)	19.25	-0.50	-2.5
OTC	6.84	3.25	Sequoia Systems Inc.	4.00	0.31	8.5
NYS	39.88	22.88	Stratus Computer Inc.	37.38	-1.50	-3.9
NYS	19.13	10.00	Tandem Computers Inc.	17.38	-0.13	-0.7
OTC	30.00	3.88	TriCord Systems	6.75	-0.13	-1.8
NYS	16.50	8.63	Unisys Corp.	10.00	-0.50	-4.8
Software						**Off 1.00%**
OTC	38.50	19.00	Adobe Systems Inc.	33.50	-1.25	-3.6
OTC	7.25	4.38	American Software Inc.	4.75	0.25	5.6
OTC	15.75	6.75	Ask Computer Systems	13.13	0.00	0.0
OTC	35.00	19.75	Autodesk Inc.	32.25	0.25	0.8
OTC	3.88	1.75	Bachman Info. Systems	3.38	0.00	0.0
OTC	28.25	20.50	BGS Systems Inc.	23.75	0.75	3.3
OTC	71.00	40.50	BMC Software Inc.	45.00	-1.25	-2.7
OTC	25.00	15.00	Boole & Babbage	25.00	3.00	13.6
OTC	17.63	8.50	Borland Int'l Inc.	9.81	-0.44	-4.3
OTC	25.00	6.75	Brock Control Systems Inc.	9.50	-0.50	-5.0
OTC	4.00	2.38	CE Software	2.63	-0.38	-12.5
ASE	30.34	6.25	Cheyenne Software Inc.	10.75	-0.38	-3.4
OTC	16.13	8.50	Cognos Inc.	14.44	-0.69	-4.5
NYS	50.88	27.38	Computer Associates	46.38	-1.13	-2.4
NYS	5.38	2.50	Computervision Corp.	3.38	-0.25	-6.9
OTC	49.25	22.75	Compuware Corp.	37.88	-0.38	-1.0
OTC	14.00	9.00	Comshare Inc.	13.25	-1.00	-7.0
OTC	16.66	9.91	Corel Corp.	14.38	-0.63	-4.2
OTC	20.50	7.25	Dataware Technologies Inc.	12.13	-0.38	-3.0
OTC	6.75	2.50	Easel Corp.	3.13	0.13	4.2
OTC	29.25	14.25	Filenet Corp.	25.50	0.00	0.0
OTC	25.00	3.00	4th Dimension	5.50	-1.25	-18.5
OTC	18.00	8.13	Frame Technology	16.00	0.00	0.0
OTC	31.25	11.50	FTP Software Inc.	25.50	1.00	4.1
OTC	11.00	7.00	Group I Software	9.25	0.50	5.7
OTC	31.75	6.75	Gupta	10.25	-0.50	-4.7
OTC	11.38	5.13	Hogan Systems Inc.	6.13	0.00	0.0
OTC	40.25	18.00	IMRS	37.38	-0.13	-0.3
OTC	39.75	11.25	Information Resources	15.38	-0.13	-0.8
OTC	28.75	14.25	Informix Corp.	24.25	-1.25	-4.9
OTC	11.25	7.75	Intergraph Corp.	8.38	0.00	0.0
OTC	8.75	2.50	Interleaf Inc.	4.31	-0.06	-1.4
OTC	18.00	8.50	Intersolv Inc.	16.13	-0.75	-4.4
OTC	73.25	27.00	Intuit Inc.	66.63	-1.88	-2.7
OTC	18.75	2.25	Knowledgeware Inc.	4.00	0.25	6.7
OTC	34.75	19.00	Legent Corp.	30.50	0.38	1.2
OTC	86.50	29.75	Lotus Development	38.25	-1.50	-3.8
OTC	17.75	5.25	Magic Software Enterprises (L)	5.25	-0.75	-12.5
OTC	15.50	6.00	Manugistics Group Inc.	8.88	0.88	10.9
OTC	27.50	14.75	MapInfo Corp.	21.88	-1.38	-5.9
OTC	7.50	1.44	MathSoft	3.00	0.00	0.0
OTC	17.00	5.88	McAfee Associates	14.25	-2.00	-12.3
OTC	17.25	9.38	Mentor Graphics	12.75	-0.75	-5.6
OTC	22.50	11.50	Micro Focus	13.75	-0.13	-0.9
OTC	11.63	4.63	Micrografx Inc.	5.63	0.00	0.0
OTC	64.13	38.25	Microsoft Corp. (H)	62.00	-0.38	-0.6
OTC	46.50	26.25	Oracle Corp.	43.13	-1.00	-2.3
OTC	40.75	21.50	Parametric Technology	35.75	1.00	2.9
OTC	24.50	13.38	ParcPlace Systems Inc.	18.00	-1.38	-7.1
OTC	66.75	26.00	Peoplesoft	59.75	-0.38	-0.6
OTC	8.13	3.63	Phoenix Technologies (H)	7.38	-0.13	-1.7
OTC	69.50	32.00	Powersoft	61.38	-4.50	-6.8
OTC	29.75	3.50	Platinum Software	12.13	0.00	0.0
OTC	23.75	8.75	Platinum Technology	20.25	-0.75	-3.6
OTC	56.75	27.00	Progress Software Corp.	31.50	0.25	0.8
OTC	4.13	1.94	Quarterdeck Office Sys.	2.44	-0.16	-6.0
OTC	24.25	9.50	Rainbow Technologies Inc.	16.00	1.13	7.6
OTC	9.25	2.63	Rasterops (L)	2.63	-0.50	-16.0
OTC	8.63	2.88	Ross Systems	4.50	0.19	4.3
OTC	24.25	2.38	Sapiens Intl. Corp. N.V.	2.88	-0.06	-2.1
OTC	20.13	9.75	Softkey International Inc. (H)	19.75	0.13	0.6
OTC	8.63	3.00	Software Publishing Corp.	5.00	-0.06	-1.2
OTC	10.00	5.00	State of the Art	8.50	0.50	6.3
NYS	35.63	25.00	Sterling Software Inc.	31.13	-0.38	-1.2
OTC	19.88	3.63	Struct. Dynamics Research	6.00	1.63	37.1
OTC	57.00	33.25	Sybase Inc.	48.00	-2.50	-5.0
OTC	19.13	9.88	Symantec Corp.	17.00	-0.50	-2.9
OTC	49.75	33.00	Synopsys	45.25	0.75	1.7
OTC	18.00	10.63	System Software Assoc.	13.75	0.88	6.8
OTC	6.75	3.25	Trinzic Corp.	5.13	0.50	10.8
OTC	30.00	11.75	ViewLogic Systems	22.00	0.25	1.1
OTC	23.25	12.25	VMark Software Inc.	15.63	-1.00	-6.0
OTC	13.25	6.25	Walker Interactive Systems	7.13	-0.25	-3.4
OTC	60.00	29.25	Wall Data Inc.	32.50	-1.63	-4.8
Semiconductors						**Off 1.39%**
NYS	31.75	16.75	Advanced Micro Devices	24.38	-2.13	-8.0
NYS	36.75	21.13	Analog Devices Inc.	34.00	-0.75	-2.2
OTC	37.38	11.81	Atmel Corp.	34.56	-1.25	-3.5
OTC	7.50	3.63	Chips and Technologies	6.25	0.25	4.2
OTC	44.63	24.88	Cirrus Logic	27.50	-0.50	-1.8
NYS	22.88	11.88	Cypress Semiconductor Corp.(H)	22.25	0.13	0.6
NYS	20.13	13.00	Dallas Semiconductor	14.00	0.00	0.0
OTC	29.25	14.75	Integrated Silicon Systems	26.00	0.00	0.0
OTC	73.50	55.88	Intel Corp.	60.75	-0.50	-0.8
NYS	44.50	13.25	LSI Logic Corp. (H)	44.00	0.50	1.1
OTC	20.13	12.25	Lattice Semiconductor	16.44	-1.06	-6.1
NYS	44.88	15.16	Micron Technology	39.25	-0.75	-1.9
NYS	60.50	42.13	Motorola Inc.	57.75	-2.00	-3.3
NYS	25.00	14.38	National Semiconductor	17.50	-0.50	-2.8
OTC	16.25	6.75	Sierra Semiconductor	14.25	-1.50	-9.5
NYS	89.50	58.75	Texas Instruments	77.13	0.88	1.1
OTC	16.38	9.38	VLSI Technology	12.50	-0.25	-2.0
OTC	11.50	2.88	Weitek	3.88	0.38	10.7
ASE	20.38	8.63	Western Digital Corp.	16.88	-0.75	-4.3
OTC	59.75	29.00	Xilinx	57.00	1.25	2.2
OTC	37.75	26.50	Zilog Inc.	27.25	-0.88	-3.1
Peripherals and Subsystems						**Off 0.76%**
OTC	30.50	14.50	American Power Conversion	17.13	-0.63	-3.5
OTC	27.25	18.25	Banctec Inc.	21.38	0.88	4.3
OTC	6.25	3.25	Cambex Corp.	3.63	0.00	0.0
ASE	5.50	1.88	Cognitronics Corp.	2.06	0.06	3.1
NYS	20.50	10.25	Conner Peripherals	11.75	-1.00	-7.8
OTC	24.00	9.75	Creative Technologies Inc.	12.63	-1.25	-9.0
OTC	13.25	3.50	Data Race Inc.	4.63	-0.25	-5.1
ASE	10.75	4.13	Dataram Corp.	5.38	0.56	11.7
NYS	23.00	12.38	EMC Corp.	23.00	1.50	7.0
OTC	11.50	3.13	Emulex Corp.	10.75	-0.13	-1.1
OTC	21.00	11.25	Evans & Sutherland	12.50	1.13	9.9
OTC	24.00	14.00	Exabyte	21.63	-1.00	-4.4
OTC	27.50	2.63	Intelligent Info. Systems	3.13	-0.13	-3.8
OTC	4.50	2.00	Iomega Corp.	4.00	-0.06	-1.5
OTC	9.75	2.88	IPL Systems Inc. (L)	3.25	0.00	0.0
OTC	28.88	15.00	Komag Inc.	24.50	-0.75	-3.0
OTC	8.63	2.63	Maxtor Corp.	3.75	-0.13	-3.2
OTC	9.38	4.88	Micropolis Corp. (H)	8.69	-0.19	-2.1
OTC	21.50	10.25	Pinnacle Micro Inc.	16.25	0.50	3.2
OTC	24.25	6.50	Printronix Inc.	24.25	2.75	12.8
NYS	10.75	6.88	QMS Inc.	9.88	-0.13	-1.3
OTC	20.25	11.63	Quantum Corp.	15.44	-0.56	-3.5
OTC	18.25	7.38	Radius Inc.	9.50	-0.63	-6.2
NYS	17.00	6.38	Recognition International	6.88	-0.50	-6.8
OTC	6.88	4.00	Rexon Inc.	5.38	0.25	4.9
OTC	28.75	18.63	Seagate Technology	24.75	-2.13	-7.9
NYS	41.50	25.00	Storage Technology	27.88	0.38	1.4
NYS	40.50	21.38	Tektronix Inc.	35.38	-2.75	-7.2
NYS	112.75	80.38	Xerox Corp.	99.63	-2.63	-2.6
Services						**Off 1.96%**
OTC	18.16	11.66	American Mgmt. Systems	17.13	0.88	5.4
NYS	4.25	2.50	Anacomp Inc.	2.63	-0.13	-4.5
OTC	20.75	14.50	Analysts Int'l	18.75	-1.25	-6.3
NYS	58.88	47.63	Auto Data Processing	57.25	-0.38	-0.7
OTC	19.50	14.00	Cambridge Tech. Partners	18.50	0.50	2.8
NYS	27.50	18.25	Ceridian Corp.	26.25	0.25	1.0
NYS	24.25	17.25	Comdisco Inc.	20.25	-0.50	-2.4
OTC	14.50	6.50	Computer Horizons	14.25	-1.25	-8.1
NYS	47.88	30.66	Computer Sciences (H)	46.00	-1.13	-2.4
NYS	10.38	6.50	Computer Task Group	7.75	-0.63	-7.5
NYS	28.63	6.75	CompUSA Inc.	12.88	-0.25	-1.9
OTC	11.38	5.50	Control Data Systems Inc.	6.25	0.00	0.0
OTC	11.00	6.13	Egghead Discount Software	8.88	0.63	7.6
NYS	38.50	26.50	General Motors E (EOS)	35.25	-2.00	-5.4
OTC	21.00	7.25	Inacom Corp.	10.25	0.75	7.9
OTC	28.00	13.63	Intelligent Electronics	14.63	-2.00	-12.0
OTC	22.50	7.00	Merisel	9.25	-0.38	-3.9
OTC	32.50	9.25	Microage Inc.	11.50	-0.38	-3.2
OTC	40.50	28.50	Paychex	36.25	-0.81	-2.2
NYS	47.75	22.25	Policy Management Sys.	45.63	-1.50	-3.2
NYS	28.25	19.75	Reynolds and Reynolds	24.00	-1.63	-6.3
OTC	28.50	17.00	SEI Corp.	19.75	-0.50	2.5

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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THEY KEEP GOING ON AND ON ABOUT HOW WE KEEP GOING ON AND ON.

Dell Latitude

Dell's Latitude series of laptops is breaking battery life records. Faster processors and color LCDs have tend

can't prove or disprove those claims. All we can say is that we used the notebook for four solid hours and still had more than 25% of the charge left, according to Dell's Windows utility that measures the battery charge. We haven't yet had enough time to drain the battery in one sitting. That says much for the efficiency of lithium-ion technology.

Laptop Buyers Guide
Vol. 12, No. 9, p. 26, p. 86

Well, listen up you beleaguered notebook nomads: I have found the Holy Grail. It's a full-featured, high-powered, name-brand notebook PC that really gets six hours of battery life and maybe more, depending on your usage pattern. It isn't the most

ON. Of the two, the Dell Latitude XP stands out, in my view, and not only because of its awesome battery life, made possible by a new lithium-ion battery technology and especially clever hardware and software that micromanages the machine's use of power.

Walter Mossberg
Wall Street Journal, 9-8-94

the road. The latest in the Latitude line—the XP—is more like a BMW. It's a hot model just off the showroom floor that's bound to draw some oohs and ahhs for its style and performance.

With the recent arrival of a

Windows Magazine
10-94, p. 124

Longest Battery Life Ever: **Dell Computer's new Latitude XP notebooks are a workaholic's dream. A preproduction DX2-50 model with a 9.5-inch active-matrix display and power management enabled ran for an astounding 7 hours, according to rundown tests by the PC World Test Center. Add to that config-**

PC World, 10-94, p. 64

extended

weight, and for these guys, compromise isn't an option.

Enter Dell's Latitude XP, the fastest, longest-lasting 486 notebook our lab has ever seen. Powered by Intel's DX4/100 processor and equipped with state-of-the-art lithium ion batteries and up to 36MB of RAM and 500MB of disk space, it rivals most desktop machines.

Extra Life All that power would be beside the point if the system could run for only a couple of hours. You're guaranteed not to have that prob with this machine. While

PC Computing
10-94, p. 57



When we introduced our Latitude™ XP notebook, we knew its eight-hour battery life[Δ] would evoke quite a few comments from the industry experts. However, recently they have been having field days at their keyboards.

Perhaps all of this hullabaloo is due to the Latitude XP notebook's workhorse Lithium Ion battery. Or perhaps it's due to the miserly power-conservation software, which intelligently adjusts energy consumption. A unique feature that helps this already powerful battery perform even more efficiently.

But do believe everything you read. Because man-oh-man, this is one heck of a notebook. Don't take our word on it, though. Take theirs.

To order your Latitude XP with eight-hour battery life,[Δ] call the number below today. But buyers, heed this caveat: people will talk.

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- 340MB Hard Drive
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Business Lease◊: $118/Mo.
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DELL LATITUDE XP
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- 8MB RAM (36MB Max RAM)
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- New Smart Lithium Ion Battery
- 3-year Limited Warranty
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([Δ]Actual battery life will vary depending on nature and frequency of use and configuration.)

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Vendors ready apps for Windows 95 ship

By Stuart J. Johnston and Ed Scannell

Microsoft Corp. and most other software developers are working frenetically to ensure there are plenty of applications ready to go when Windows 95, the next version of Windows, ships in the first half of next year.

If the demonstrations at Comdex/Fall '94 this week are any guide, users should have a good selection of true 32-bit applications to choose from. Heavy hitters lifting the curtain at the show include the following:

- Lotus Development Corp. will preview Windows 95 versions of 1-2-3, Ami Pro and Freelance Graphics, the mainstays of its SmartSuite bundle, a spokesman said. The applications will support drag-and-drop capabilities and long file names, but Lotus may not show pre-emptive multitasking or multithreaded execution. However, these features will be in the final products, the spokesman said.
- Novell, Inc.'s WordPerfect division is showing off an alpha version of WordPerfect that features multithreaded execution, full drag-and-drop capabilities and takes advantage of Windows 95's new graphical user interface, according to a spokeswoman.
- Microsoft is showing "bits and pieces" of its Excel, Word and PowerPoint applications with Windows 95 support, said Dennis Tevlin, group product manager for the Office suite.
- Oracle Corp. will show a native 32-bit version of Oracle Forms and plans to have a complete set of its Cooperative Development Environment (CDE) tools, said Dennis Moore, senior director of CDE product marketing.

Did you know?
No major applications vendor had Windows 3.0-specific applications out in the six months following Windows 3.0's release.

Many companies — including Lotus, WordPerfect and Microsoft — missed the buying craze that followed shipment of Windows 3.0 in 1990 by being late to market with versions of their products that took specific advantage of the environment.

Lotus said it plans to ship its applications within 90 days of Windows 95 and hopes to do it within 60 days, while WordPerfect did not disclose a plan for when it will ship Windows 95 products. Microsoft, meanwhile, will ship compatible applications within 90 days of when the operating system ships, Tevlin said.

Altogether, more than 30 software vendors will exhibit Windows 95 products at the show.

Beta users put Windows 95 through its paces. See page 47.

Windows 95

CONTINUED FROM COVER 1

"We are going to have extremely high movement to Windows 95," said Briscoe Stephens, coordinator for space sciences in the Advanced Scientific Information Systems group at NASA in Huntsville, Ala. He cited the ease of use of the new interface as a significant factor for his users.

Some recent analyst surveys and reports anticipate a relatively rapid move to Windows 95. Although their estimates range from conservative to exceptionally optimistic, most expect a hefty percentage of users to make the move to the operating environment during its first 12 months.

Among the 14 IS managers interviewed by *Computerworld*, only one was unsure whether his firm would go to Windows 95.

"We don't have any plans right now," said Michael Schaeffer, LAN support team leader at Amoco Corp.'s Chicago campus.

Maybe, maybe not

And not all analysts were so optimistic that a speedy user shift would occur.

"I think clearly there's great anticipation, and people will migrate to Windows 95. But it's not going to happen overnight," said Judith Hurwitz, president of Hurwitz Consulting Group in Watertown, Mass.

Microsoft has left little to chance, however. It began distributing alpha copies of Windows 95 more than a year ago, started beta-testing in June this year and just started a second round of beta tests (see story page 47). Early next year a preview program will seed the market by providing users with more than 100,000 copies at a "nominal" fee to cover manufacturing and shipping costs.

IS managers who are revving up to migrate cite as primary reasons Windows 95's 32-bit pre-emptive multitasking execution and new user interface.

"What we also like is the dovetail fit we have with Windows 95 and Windows NT," said Bill Mattox, a systems consultant at a large international financial services firm.

Of course, some IS managers have more aggressive migration plans than others.

"I've already purchased 300 copies . . . and we're going to migrate over, probably before they ship [the commercial release]," said Greg Scott, IS manager at the college of business at Oregon State University in Corvallis.

"I've got enough problems right now with Windows 3.1's memory manager that Windows 95 can't be any worse," he added.

Still others will move more slowly.

"There is no question that we will roll out [Windows 95] in the long run," said Ronan McGrath, vice president of IS and accounting at the Canadian National Railway Co. in Montreal. "I do not want to have mixed environments . . . [so] the big problem is, how do you conduct an organized rollout between the two?"

A recent report by Cambridge, Mass.-based Forrester Research, Inc. surveyed 50 IS directors and technology planners from Fortune 1,000 firms. The survey found that "assuming [Windows 95] ships in the first half of 1995, interviewees say they will upgrade about one-third of their currently installed PCs by year's end."

"Our research kind of blew our socks off because many of these companies we interviewed are not exactly bleeding edge," said Paul Callahan, a senior analyst of network strategy and one of the report's authors.

Forrester's conclusions are reinforced in a report by PaineWebber, Inc. in New York.

"We're [predicting total Windows 95] shipments will hit in the 35 [million]- to 40 million-unit range in the first 12 months after it ships," said Michael Kwatinetz, an analyst at PaineWebber.

Novell tries again

CONTINUED FROM COVER 1

vestment bank in New York, who requested anonymity. "I told them last time that the tools were inadequate and to go back to the drawing board."

While previous rollouts of the product have focused only on the merits of NetWare Directory Services (NDS), this rollout will be different in that it will provide tools to migrate from NetWare 3.1 to NetWare 4.x. Also, it will provide better tools for setting up NDS and customizing it.



Novell's Robert Frankenberg *hopes to sell users on NetWare 4.x*

There were previously no tools to accommodate directory changes once NetWare 4.x was loaded.

Also, because of improved directory application programming interfaces provided to developers, many NetWare Loadable Modules (NLM) that will run with NDS will be on the market when NetWare 4.1 ships. More than 80 NLMs will run with NetWare 4.1, said Richard King, executive vice president at Novell's NetWare Systems Group.

However, to put this grand strategy in place, Novell must deliver its already-late products. NetWare 4.1 will be delivered in weeks, but it is almost a year late. PerfectOffice, the new applications suite announced in June and originally slated to ship in September, has not shipped either.

"The reception of this product is absolutely critical to Novell," said Mary McCaffrey, an analyst at Alex. Brown & Sons, Inc., an investment bank in New York.

The NetWare 4.1 beta release has been well received. Beta users cited improvements in a number of key services that were either missing or not well integrated with previous versions of NetWare 4.x. This includes the messaging transport layer, Global Message Handling Service, which now has been integrated into NetWare 4.1. Unlike previous versions of 4.x, NetWare 4.1 will also include System Fault Tolerance III.

But in the future, it is the new applications and services that will be provided only in NetWare 4.x that Novell hopes will entice reluctant NetWare 3.x users to take the upgrade plunge, King said.

Specifically, Novell plans to deliver a number of mediums that can be viewed using its Corsair technology. Corsair will include a browser, called "ferret," and a back-end information server. The browser will be able to travel over Novell's NDS, the AT&T Corp. public network and the Internet.

Tabbing capability

Novell is planning to package the back end of Corsair, now called the information server, as an NLM. It also may integrate the back end with its SoftSolutions document management tool. The information server will reside on NetWare 3.x and 4.x servers.

When the information server ships as expected in the first half of next year, network administrators will receive tools to build a graphical model that represents a departmental function within the site. By attaching this NLM to NDS, an end user can graphically search the site for documents that have been tabbed within the site. Novell will also provide tools via WordPerfect for tabbing documents.

For example, with this tool, a human resources department will be able to build a graphical depiction of a forms bin. By clicking on the interface, the user can navigate into and pull out an employee referral form, said Ransom Love, marketing manager at the Advanced Access Application division of Novell.

Novell also plans to deliver its NetWare Connect Services (NCS) during the first half of next year. NCS propagates NDS across the AT&T service. Furthermore, Novell is now negotiating with a number of regional telephone companies and international public carriers to run NCS on their networks.

A new version of PerfectOffice, the suite from the Novell Applications Group, will also include the Corsair browser, Novell officials said.

Getting in sync

Novell will make the following NetWare 4.x features available in three weeks:

- NetSync, which integrates 3.x and 4.x directories
- Integrated Global MHS
- A stratified pricing model
- CD-ROM with test drive NLMs
- System Fault Tolerance III

Source: Novell, Inc.

Wysiwyg



Internet on ice

Action-starved hockey fans on the Internet can get their fix by following the Russian Dream Team All-Star Hockey Tour. The team, made up of Russian NHL players, is playing five games against Russian hockey teams. Sun Microsystems will manage the Internet information on a Sun SPARC-based server. Up-to-the-minute game reports, previews, summaries and player and team statistics are available at http://www.starwave.com/SatchelSports.html.

Bring in the negotiator!

Hostages:

lead designers sent to customer sites to get the systems working when the data and tools are available only at home. They show the flag, look intelligent and spend long hours talking to the customer.



Source: "Tidbits" by L. Bernstein

See where to ski



With snow beginning to fall in many parts of the country, Media Odyssey in Denver has help for skiers wondering which slopes to hit next. Skiodyssey Interactive Annual is a multimedia CD-ROM ski travel planner that includes detailed descriptions, sound, video clips and photographs of more than 400 U.S. ski areas. The software helps users focus on certain areas that fit their requirements then provides statistics, trail maps, information on lodging, restaurants and shops and travel directions.

WYSIWYG compiled by Tim Ouellette. Illustrations by David Marshall.

Inside Lines

Give us a break

As if the Interface Group weren't making enough money on the 190,000 people expected to attend Comdex/Fall '94 this week, the group came up with a new money-making scheme this year. It decided to charge users extra — something like $100 a head — to attend the keynote speeches. The greedy group had already collected a tidy amount when Microsoft Chairman Bill Gates, Monday's keynoter, got wind of the scheme and went ballistic. Reportedly, both he and Intel CEO Andy Grove threatened to cancel their appearances if the fee wasn't dropped. It was. But the money already collected won't be refunded; it'll be donated to charity.

Will they or won't they?

At last week's common PowerPC platform announcement, executives from IBM, Apple and Motorola batted away repeated questions about IBM's plans to license the Macintosh operating system by chanting, "Today is a hardware announcement." But eventually, Nobuo Mii, IBM Power Personal Systems division general manager, wandered from the script and admitted IBM would "definitely" ship its common platform with the Macintosh in 1996. An IBM spokesman later said, nah, he didn't mean it. No decision has yet been made.

Wanted: One programmer and a time machine

When IBM settled on OS/2 V3 as the name for its latest version of the operating system, it made up some 100,000 boxes with the V3 logo on them. But at the last minute, IBM Chairman Lou Gerstner decided to change the name to OS/2 Warp, which forced the company to trash 100,000 boxes. At about 70 cents a box, it was an expensive change of mind. For $70,000 the company might have hired a good programmer to fix the bug that delayed delivery of OS/2 Warp a couple of weeks ago.

Simon says, 'Apply this'

Why buy a PDA without applications to run on it? We don't know and neither do those few folks who bought Newton out of the box. But BellSouth Cellular, which sent Simon to market *sans* apps, apparently saw the error of its ways. Tomorrow, the combination cellular phone/PDA will get DispatchIt, its first application, sources close to the company said. DispatchIt will reportedly allow Simon to receive and send data over wireless networks. It was co-developed by BellSouth and PDA Dimensions.

OK, but what about the spotted owl?

In cost-justifying a sizable data warehousing project recently, Van Waters & Rogers, a big chemicals distributor in Kirkland, Wash., went green. The company actually calculated the number of trees it would save by providing users with on-line reports instead of having IS folks run, print and distribute paper copies. The savings? Twelve trees per month.

Flashy new Alpha chip on horizon

The lack of a market for its chips — outside its own company, that is — has not stopped Digital from announcing some of the industry's fastest chips. At Comdex, the company will announce the first on-chip implementation of the PCI bus on its new Alpha 21066A chip. The chip will be available in two speeds — 100 MHz and 233 MHz — and targets the Windows NT market, according to sources briefed on the company's plans. Production is scheduled to begin in the first quarter of next year.

Remember the spring post-Comdex antiporn pronouncement by Interface Group chief Shelly Adelson? Well, this year, Shelly's own Sands Hotel and Convention Center will house such exhibitors as Vivid Interactive and its XXX CD lineup, including "Voices in My Bed." The Interface Group says the exhibits are fine as long as they contain no nudity. To pass along a few bare facts, however, get in touch with Computerworld *with news items or tips via our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179 and via the Internet at mjohnson@cw.com.*

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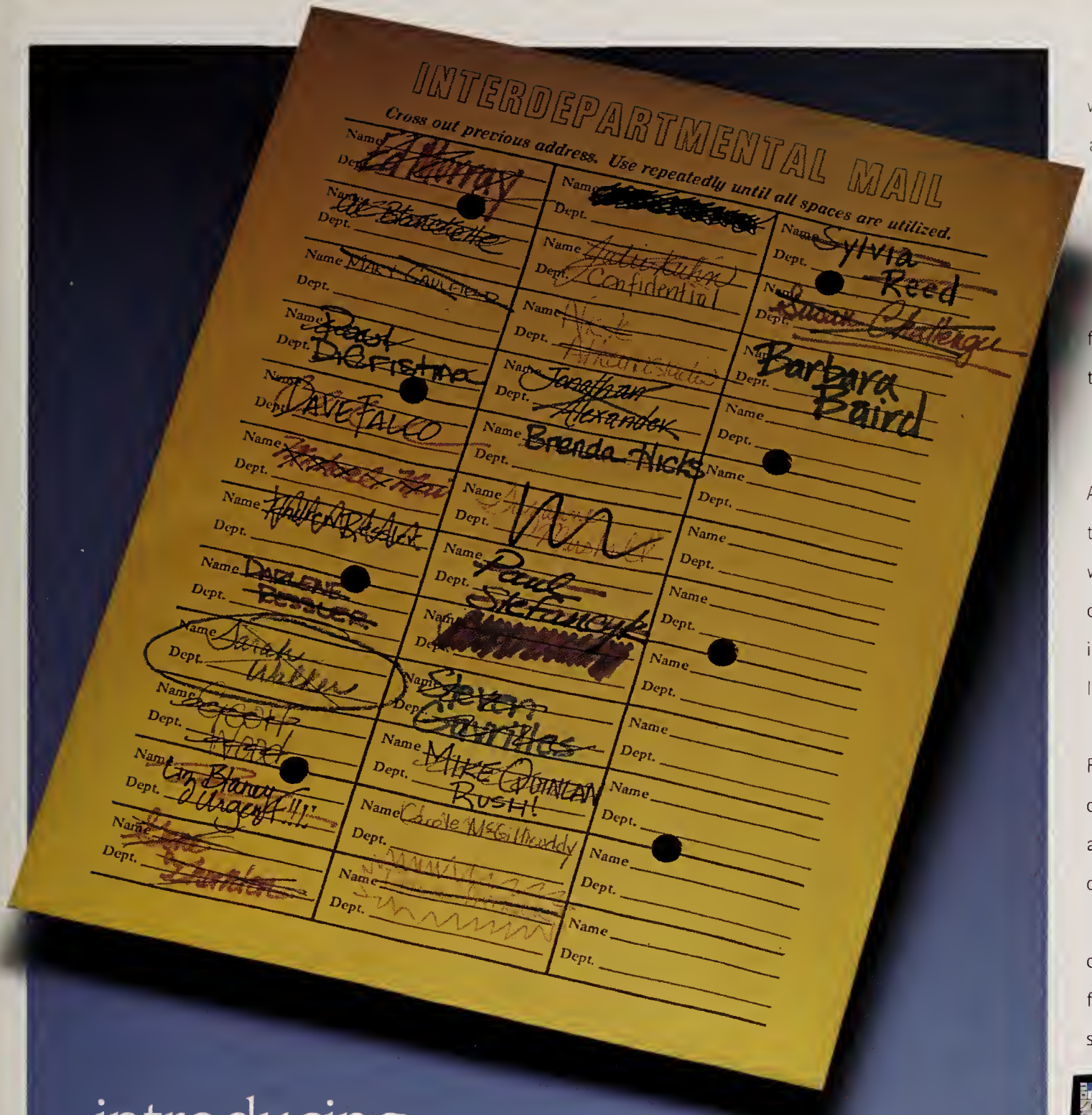
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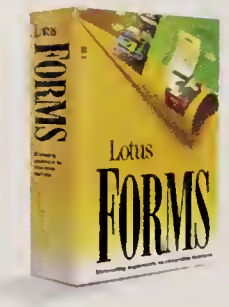
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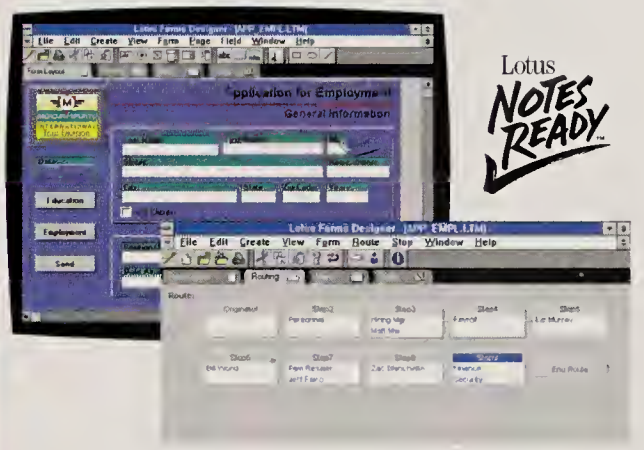
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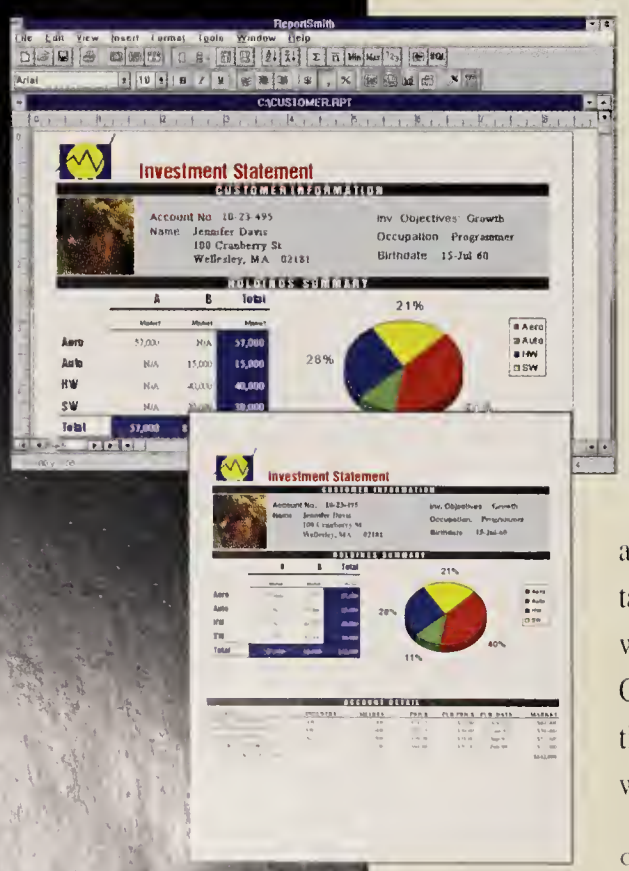
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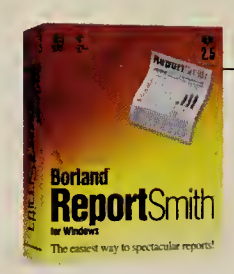
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